VBS Purvanchal University, Jaunpur

Syllabus
M.Sc. Ag. (Two Year Degree Course)
Agricultural Zoology & Entomology

Agricultural Zoology & Entomology - First Year			
Sl. No.	Paper	Paper Name	Maximum Marks
1	I	Introductory Entomology	100
2	II	Economic Entomology	100
3	III	Agriculture Statistics	50
4	--	Practical (Based on I & II Paper)	100
		Total Marks	350

Agricultural Zoology & Entomology - Final Year			
Sl. No.	Paper	Paper Name	Maximum Marks
1	IV	Internal Morphology, Physiology and toxicology	100
2	V	Applied Entomology.	100
3	VI	Integrated Pest Management	100
		Or Thesis	
4	--	Practical (Based on IV & V Paper)	100
5	--	Practical (Based on Paper VI) **or** Viva Voce (Based on Thesis)	50
		Total Marks	450

VBS Purvanchal University, Jaunpur

Syllabus

M.Sc. Agcultureal Zoology & Entomology
Previous Year
Paper I
Introductory Entomology

M. Marks: 100

Theory

Section-I

History and development of entomology. Position of insects in the phylum arthopoda; relationship with other arthropoda. Causes of dominance of insects. Classification of insects up to the order level. Habit, Habitat and distinguishing characters of different order. Distinguishing characters of families of economic importance. International code of zoological nomenclature.

Section-II

Body wall: structure, cuticular outgrowths, Colouration and special integumentary structures, Body regions: Sclerites and segmentation. Head: structure, type of mouth parts and antennae. Thorax; sclerities and ptero-thorax. Wings structure, Venation, wing Coupling and mechanism of flight. Legs: segmentation and types. Abdomen: Segmentation and appendages. Genitalia and their modifications.

Section-III

General accounts of insect embryology: Embryonic and post Embryonic development. Types of metamorphosis.

VBS Purvanchal University, Jaunpur

Paper II
Economic Entomology

M. Marks: 100

Theory

Section-I

Detailed account of systematic position, identification distribution, host ranges, biology, nature, extent of damage, seasonal history of pests of paddy, sorghum, maize, millets, wheat, barley, pulses, fruits, vegetables-(okra, bringal, cucurbits, tomato, chillies etc.) cotton, tobacco, oilseeds, sugarcane.

Section-II

Pests of stored products, detection and estimation of infestation. Management of store product pests. Evaluation and efficacy of storage structures.

Section-III

Polyphagous pests-locusts, termites, Witegrubs, hairy caterpillars and grosshoppers and International insect pests.

Section-IV

Non-insect pests- mites, snails, birds and rats.

Section-V

Study of different species of commercial insects- like; lac-insect, silk worm and honey bees, there distinguishing features, biology, management, agricultural and industrial importance.

Section-VI

Veterinary entomology (Major insect pests of live stock).

Paper III
Agriculture Statistics

M. Marks: 50

Theory

Syllabus of Agricultural Statistics is similar for all students of MSc. Ag. Students, accept MSc. Ag. Economics Students.

VBS Purvanchal University, Jaunpur

Practical

M. Marks: 100

Practical: Based on Paper I (Introductory Entomology)

1. Classification of animals into orders and families of agricultural importance.
2. Identification and comments on animals of Agricultural Importance.
3. Stained preparation of mouthparts, Antennae, Legs, wings.
4. Insect collection, Educational tour and submission of report of insects from the Varied Zone of the Country.
5. Comparative study of various regions of insect body and their appendages.
6. Study of the life history of two insect pests one each from bemi and holometabolous insects.
7. Class records and Viva-Voce.

Practical: Based on Paper II (Economic Entomology)

1. Collection and identification of important pests and their natural enemies.
2. Field observations on damage caused by pests.
3. Comments on damaged material.
4. Collection of insect pests according to the crops.
5. Identification of commercial insects and comments on the products obtained.
6. Class records and viva-voce.

VBS Purvanchal University, Jaunpur

Syllabus
M.Sc. Agcultureal Zoology & Entomology
Final Year

Paper IV
Internal Morphology, Physiology and Toxicology

M. Marks: 100

Theory

Section-I

Structure modification and physiology of different systems: digestive, circulatory, respiratory, excretory, nervous, reproductive, sense organs, exo endocrine glands.

Section-II

Physiology of moulting, role of enzymes in growth and metamorphosis, Nutrition of insect: Role of vitamins, proteins, carbohydrates, lipids and minerals.

Section-III

Principles of toxicology, classification of pesticides based on chemical structure, Mode of entry, Mode of action. Toxicity and structure activity relationship. Mode of action and therapeutic methods for control of poisoning of chlorinated hydrocarbons, organophosphates, carbonates, natural and synthetic pyrethriuds. Systemic insecticides, phytotoxicity, Compatability, antagonism and synergism.

Section-IV

Factors affecting toxicity of insecticides, insecticide resistance and resurgence, insecticide act. 1968.

Section-V

Plant protection appliances, pesticide formulations. Hazards of pesticides to humans, domestic animals and wild life.

VBS Purvanchal University, Jaunpur

Paper V
Applied Entomology

M. Marks: 100

Theory

Section-I

Principles of ecology, environment and its components. Effect of biotic and abiotic factors and bionomics, distribution, abundance and natural balance. Inter and intra-specific relation-ships. Dispersal and migration. Life table studies. Population models. Surveillance and forecasting, causes of insect out-breaks, Diapause.

Section-II

Principles of insect control: Natural and Applied.

A- Natural control with reference to climatic factures, Natural barriers, Natural enemies and insect diseases.

B- Methods of applies control:

i. **Chemical control**: Detained study of insecticides- inorganic, natural organic and synthetic organic insecticides and fumigants, their formulations and compatibility; preparations, necessary precautions in their uses, Attractants, repellents, auxiliary and synergistic substances, wetting, spreading and emulsifying agents, chemicals of botanical origin i.e. azadirachtin.

ii. **Physical and mechanical control**: Collection of adults and their stages by hand or machine. Barriers, grease bands and different traps. Artificial cooling and superheating in sun or by machine. Burning, flooding, draining and dehydration. Use of electricity, light and sound waves.

iii. **Cultural control**: Crop rotation destruction of crop residues and weeds, tillage, variations in the time of planting and harvesting. Host plant resistance, causes and mechanism of resistance, successful examples.

iv. **Biological control**: Scope and use of micro-organism bacteria, fungi, Viruses and protozoa in insect control. Scope and use of parasitic and predatory invertebrate animals-nematode and insects. The breeding and liberation of parasites and predators. Some successful examples in India and abroad.

v. **Legal control**: Quarantine and inspection laws. Laws of inforce, control measures. Insecticidal laws governing the manufacturers, Sale, adulteration and misbranding of insecticides.

Section-III

Principles and components of integrated pest management. Economic thresholds, Economic injury levels. Action Thresholds, gain thresholds, Damage boundary,. Case histories in IPM.

Section-IV

Insecticide poisoning and remedial measures.

VBS Purvanchal University, Jaunpur

Paper VI
Integrated Pest Management (I.P.M.)

M. Marks: 50

Theory

Section-I

Definitions of integrated pest management and insect pest control, principles of integrated pest management.

Section-II

Need and concept of pest management, ecological background and economic pest management, techniques and strategies of IPM.

Section-III

Examples of insect pest management in field crops- cotton, rice, maize, vegetables and fruit trees and economics of pest management.

Section-IV

Decision making areas, cost-benefit ratio, ecological sound approaches for the insect pest control.

Or

Students have to take Thesis work (Research work) which is option of VI Paper of final examination. Research work for thesis may begin in the previous Year.

Practical

M. Marks: 100

Practical: Based on IV Paper- Internal Morphology, Physiology and Toxicology

1. Dissection of suitable insect for internal anatomy.
2. Permanent stained preparation of mouth parts and internal organ of insects.
3. Identification and comment upon various formulations of pesticides.
4. An acquaintance with the various pesticide appliances.
5. Numerical exercise based upon calculation of dosages/concentration.
6. Visit to pesticide manufacturing industry.
7. Practical record and viva-voce.

Practical (Based on Paper-V-Applied Entomology)

1. Identification, Preparation, Formula and employment of standard insecticides.
2. Study of different manufacturers of insecticides.
3. Familiarity with spraying and dusting appliances and apparatus used in insect-pest control.
4. Class record and viva-voce.

Practical

M. Marks: 50

VBS Purvanchal University, Jaunpur

Practical: Based on Paper VI- I.P.M.

1. Study the IPM of Rice ecosystem.
2. Study the IPM of oil-seas (Mustard) ecosystem.
3. Identify the decision making areas.
4. Class record and viva-voce.