

M.Sc. Ag. Plant Protection

Semester I

S.No.	Course Code	Title	Credits
1	PPR-810	Mycology	4(3+0+2)
2	PPR-811	Phytonematology	3(2+0+2)
3	PPR-831	Insect Morphology & Anatomy	3(2+0+2)
4	PPR-832	Insect Physiology & Nutrition	3(2+0+2)
5	COMP-705	Comp Orientation	3(2+0+2)
6	MAS-711	Statistics-I	3(2+0+2)
		Total	19 Credits

Semester II

S.No.	Course Code	Title	Credits
1	PPR-815	Phytovirology and Phytobacteriology	3(2+0+2)
2	PPR-834	Insect Taxonomy	3(2+0+2)
3	PPR-819	Principles of Plant disease management	3(2+0+2)
4	PPR-818	Crop Diseases and their Management	3(2+0+2)
5	PPR-836	Principles of Insect Pest Management	2(1+0+2)
	MAs-715	Statistics- II	3(2+0+2)
		Total	17 Credits

Semester III

S.No.	Course Code	Title	Credits
1	PPR-825	Disease epidemiology, Forecasting and Estimation of Losses	3(2+0+2)
2	PPR-827	App. Tech. & Maintenance of Plant Prot. Equipment	3(0+0+6)
3	PPR-843	Crop Insect Pests & their Management	4(3+0+2)
4	PPR-835	Insect Ecology	3(2+0+2)
5	AGRN-803	Weeds & their control	3(2+0+2)
6	PPR-889	Seminar	2
		Total	18 Credits

Semester IV

S.No.	Course Code	Title	Credits
1	PPR-899	Thesis	15
		Total	15

Overall total of Credits

Semester I-19

Semester II-17

Semester III-18

Semester IV-15

M.Sc. Ag. Plant Protection Syllabus (Semester system)

Semester –I

PPR 831 Insect Morphology and anatomy

3(2+0+2)

Principles, utility and relevance; Integument- structure, colours, outgrowths, appendages, functions; Head-organ , definitive insect head, appendages, antennae, mouthparts and modifications, tentorium, Neck-sclerites; Thorax-sclerites, sutures, ridges, areas of tergum, sternum and pleuron, pterothorax, their modifications, wings- origin, structure, modification, venation, articulation, wing coupling; legs- structure, articulation, modification; Abdomen- Sclerites, pregenital, genital segments, appendages, genitalia modifications; Embryology and Development.

Scope and importance of insect anatomy; Anatomy of digestive, excretory, respiratory, circulatory, nervous, endocrine, exocrine and reproductive systems; Anatomy of muscles; Sense organs and insect behavior.

Practical:

Preparation of permanent and temporary mounts/ slides; integument outgrowths; General morphology of grasshopper; Head sclerites, sutures, areas types, tentorium; Types of antennae, mouthparts, and their modification, grasshopper, honey bee, red cotton bug, thrips, butterfly, house fly, caterpillar; Thorax-sclerites, wing types and venation, wing coupling; Legs- types; Abdomen-stinging organ in bees, genitalia, post embryonic development.

Dissection of insects to study comparative modification in different systems, grasshopper, bugs, flies, bees, beetles, moths.

PPR 832 Insect Physiology and Nutrition

3(2+0+2)

Scope and importance of insect physiology; Physiology of digestive, excretory, respiratory, circulatory, nervous, endocrine, exocrine and reproductive systems; Physiology of muscles; Metabolism of carbohydrates, lipids and nitrogenous insects; stored grain insects and beneficial insects; Role of vitamins, proteins, amino acids, carbohydrates, lipids and minerals and other food constituents in insect nutrition; Extra and intra cellular microorganisms and their role in physiology; food preferences in insects.

Practical:

Experiments to study gas exchange, specific gravity and volume or hieroglyph, excretory efficiency and excretory products, digestibility and digestive enzymes; demonstration hormonal and pheromone activity in insects; Formulations and preparation of artificial diets for rearing insects.

PPR 810**Mycology****4(3+0+2)**

Definition of different terms; importance of mycology in agriculture; relation of fungi to human affairs; history of mycology; modern concepts of nomenclature in classification of fungi, critical account of comparative morphology, taxonomy, life cycle, ultra structure and reproduction of different groups of fungi upto genera level. Developmental morphology and its impact on taxonomy of fungi.

Practical :

Exercise on detailed comparative study of morphology; anatomy of reproductive groups of fungi; collection of cultures and live specimens.

PPR 811**Phytonematology****3(2+0+2)**

History, morphology and anatomy of body wall, digestive, reproductive, excretory and nervous system; body cavity; taxonomic concepts, classification with emphasis on phytonematodes; nematological techniques; nematodes as pests of crops, nematode ecology and disease compels; nematode biology and physiology; nematode control.

Practical:

Sampling and extraction techniques for endo and ecto-parasitic nematodes; counting estimation of soil populations; killing; fixing and preserving, preparing mounts; staining nematode in plant tissues; pathogenecity techniques; morphology studies of different body systems, drawing measurement of nematodes; identification of phyto-parasitic nematodes upto genetic level; familiarity with important nematode diseases and their control.

Semester –II**PPR 815****Phytovirology & Phytobacteriology 4(3+0+2)**

History ; symptoms; anatomical change in viral infected plants; inclusion bodies transmission and virus-vector relationships; movement; assay; chemistry of viruses; purification, morphology and architecture; serology; replication;

resistance of plants to viruses; prospects of viral disease chemotherapy; application of tissue culture in plant virology; Myco-viruses; satellite viruses; viroids.

Introduction; general characters of bacteria; history of phyto-bacteriology; classification and nomenclature of phyto-pathogenic bacteria; general symptoms; survival dissemination and infection process; concepts and mechanism of blight, soft rots, wilts and crown gall development; host defense mechanisms; epidemiological relationships of bacterial plant pathogens.

Practical :

Transmission of viruses; diagnosis of viral diseases; observation of inclusion bodies, technique for raising of antisera; sensitivity tests of tetracycline. Isolation, purification and host inoculation of phyto-pathogenic bacteria; staining methods; testing of antibacterial chemicals/ antibiotics.

PPR 834

Insect Taxonomy

3(2+0+2)

Relationship between systematic and taxonomy; Zoological nomenclature and zoological classification; history of insect Systematics, insect phylogeny, current classification; Importance of taxonomy and level of systematics; Phenetics and cladistics, concept of species, sub- species and taxonomic categories; Intraspecific categories and biotypes; Procedures in identification and kinds of Taxonomic key; Principles and application of zoological nomenclature, international code of zoological nomenclature; Zoological regions and ethics in taxonomy; Paleontology, fossil insect orders; Taxonomic publications; Description of new taxa.

Practical :

Taxonomic collections, curation of insects, preparation of slides for making illustrations, illustrating taxonomic characters; Photography of insects and their parts, identification of insects with the help of taxonomic keys; Study of variation in a population; preparation of taxonomic keys, Morpho-metric analysis; Repository of insect collection; Website visits to museums.

PPR 819

Principles of Plant disease Management

3(2+0+2)

Objectives and significance; principles physical, cultural (including resistance), Biological regulatory and chemical ; pesticides-classification; Plant Protection schedules for important crops.

Practical :

Disease rating scales; conversion factors/ formulae; exercises for chemical application, bioassay of fungicides in vitro and in –vivo evaluation of chemicals against plant pathogens; preparation and use of Bordeaux mixture.

PPR 818 Crop Diseases and their Management 3(2+0+2)

Nature, prevalence and etiology; factors affecting disease development and control measures of important diseases of cereals, millets, pulses, oil seeds, cotton, sugarcane, tobacco, coconut, tea, coffee, rubber and fodder crops; disease of fruit crops- citrus, mango, guava, grapes, banana, pear, peach, papaya, pomegranate, apple, vegetables crops- root, bulb, leafy crops; cruciferous, cucurbits, solanaceous and malvaceous; spice crops-coriander, turmeric, chilli, cumin flowering and aromatic plants.

Practical :

Detailed study of symptoms and host- parasite relationships of representative disease.

PPR 836 Principals of insect pest management 3(2+0+2)

The concept and history of pest management; tools of pest management; Ecological and socio-economic aspects; Cost/ Benefit ratios; Cultural, Biological, Chemical, Genetic, Legal and other control tactics and their integration for pest management, Sampling and measuring the economic levels of damage, economic injury level and economic threshold; Analysis and modeling for pest management and case histories; Decision making for need influenced by biotic and abiotic factors; key factor and time series analysis in pest management; Pest management in major crops; Integration of IPM options in interacted farming systems and sustainable agriculture.

Practical:

Study of flora and fauna in different crop habitats; Calculation of diversity index and economic thresholds; Demonstration of IPM technology in field crops; Scouting impact analysis; IPM in protected cultivation system.

Semester –III

PPR 827 Application Techniques & Maintenance of Plant

Protection Equipment

3(0+0+6)

History and principles of toxicology; Pesticides- their classification; mode of action; Metabolism and toxicity, synergism, antagonism, systemic and selective Pesticides; insect resistance of insecticides; Pesticides compatibility; Pesticide residue, their significance, analysis and environmental implications; Diagnosis and treatment of pesticides poisoning; safe use, first aid; specific antidotes for pesticide, poisoning and their treatment; Plant products; pesticide formulation, mixtures; handling and storage of pesticides; Application techniques and maintenance of Plant Protection Equipment.

Practical:

Preparation of laboratory formulations and standard concentrations of insecticides; Bioassay techniques; testing of relative toxicity and synergism; Toxicological statistics; Sampling for insecticide residue, their extraction, cleanup and estimation by colorimetric, enzymatic and chromatographic techniques; Compatibility of pesticides, phyto-toxicity, toxicity to beneficial organisms.

PPR 843 Insect pests of crops and their management 4(3+0+2)

Study of important insect pests of field crops and their management ; Cereals (Rice, Wheat): Millets; Pulses; Oilseeds (Castor, coconut, groundnut, linseed, mustard, rape, Niger, Safflower, sesamum and sunflower); Fibre crops (Cotton, Jute, Mesta, Roselle); Sugarcane, stored grain pests.

Study of important insect pests of fruits; vegetables; tropical tuber crops; ornamental plants, aromatic plants; plantation crops; spices and their management.

Practical:

Identification and study of various insects pests of field crops, stored grain pests, pests of fruits, vegetables, tropical tuber crops, ornamental plants, aromatic

