

## VETERINARY EPIDEMIOLOGY AND PREVENTIVE MEDICINE

### Course Structure - at a Glance

CODE	COURSE TITLE	CREDITS
VEP 601	PRINCIPLES OF EPIDEMIOLOGY	2+0
VEP 602	APPLIED EPIDEMIOLOGY	1+1
VEP 603	LIVESTOCK AND POULTRY DISEASE INVESTIGATION	0+2
VEP 604	VETERINARY CLINICAL EPIDEMIOLOGY	1+1
VEP 605	BIOSECURITY PRACTICES IN DISEASE PREVENTION	1+1
VEP 606	INFECTIOUS DISEASES OF RUMINANTS -I	2+1
VEP 607	INFECTIOUS DISEASES OF RUMINANTS -II	2+1
VEP 608	INFECTIOUS DISEASES OF EQUINES	1+1
VEP 609	INFECTIOUS DISEASES OF CANINES AND FELINES	2+1
VEP 610	INFECTIOUS DISEASES OF POULTRY	2+1
VEP 611	INFECTIOUS DISEASES OF ANIMAL SPECIES OF REGIONAL IMPORTANCE	2+1
VEP 612	INFECTIOUS DISEASES OF LABORATORY AND ZOO ANIMALS	1+0
VEP 691	MASTER'S SEMINAR	1+0
VEP 699	MASTER'S RESEARCH	20
VEP 701	RECENT CONCEPTS IN EPIDEMIOLOGY AND DISEASE FORECASTING	2+1
VEP 702	HERD HEALTH MANAGEMENT	2+1
VEP 703	DATA COLLECTION , MANAGEMENT AND PRESENTATION	2+1
VEP 704	SURVEY AND SURVEILLANCE	2+1
VEP 705	EMERGING AND RE-EMERGING ANIMAL DISEASES	2+0
VEP 706	ECOLOGY OF DISEASES	2+0
VEP 707	MOLECULAR APPROACHES IN EPIDEMIOLOGY	2+1
VEP 708	ADVANCES IN PREVENTION & CONTROL OF INFECTIOUS DISEASES OF RUMINANTS	2+1
VEP 709	ADVANCES IN PREVENTION AND CONTROL OF INFECTIOUS DISEASES OF EQUINES	2+1
VEP 710	ADVANCES IN PREVENTION AND CONTROL OF DISEASES IN PET ANIMALS	2+1
VEP 711	ADVANCES IN PREVENTION AND CONTROL OF DISEASES IN POULTRY	2+1
VEP 712	ADVANCES IN INFECTIOUS DISEASES OF LABORATORY AND ZOO ANIMALS	1+0
VEP 713	ADVANCES IN DIAGNOSIS AND MANAGEMENT OF TOXICOLOGICAL CONDITIONS	1+1
VEP 790	SPECIAL PROBLEM	0+2
VEP 791	DOCTORAL SEMINAR I	1+0
VEP 792	DOCTORAL SEMINAR II	1+0
VEP 799	DOCTORAL RESEARCH	45

#### **VEP 601: PRINCIPLES OF EPIDEMIOLOGY**

**2+0**

**Objective :** To familiarize students with epidemiological concepts.

##### **Theory**

##### **UNIT I**

Definitions, scope, concepts, types, application and common terms used in epidemiology.

##### **UNIT II**

Host-Agent-Environmental factors in causation of diseases and disease patterns.

##### **UNIT III**

Epidemiological data: its nature, sources, collection, storage, retrieval and presentation.

##### **UNIT IV**

Epidemiological studies: Experimental and observational, international organizations and laws regulating animal diseases.

##### **Suggested Readings**

Martin SW, Meek AH & Willeberg P. 1993. *Veterinary Epidemiology: Principles and Methods*. IBH. Narayan KG. 2004. *Epidemiology, Diagnosis and Management of Zoonoses*. ICAR. Schwabe CW, Riemann HP & Franti CE. 1984. *Epidemiology in Veterinary Practice*. 3<sup>rd</sup> Ed. Lea & Fabiger. Thrusfield M. 2004. *Veterinary Epidemiology*. 8<sup>th</sup> Ed. Blackwell.

#### **VEP 602: APPLIED EPIDEMIOLOGY**

**1+1**

**Objective :** To acquaint students with the application of epidemiology in disease diagnosis, prevention and control.

##### **Theory**

##### **UNIT I**

Surveys, sampling and collection of information, design questionnaires, disease monitoring and surveillance.

##### **UNIT II**

Epidemiological investigations of disease outbreak, modeling, disease forecasting, serological and molecular epidemiology.

##### **UNIT III**

Economics of diseases and different strategies for prevention and control of diseases and syndromes. Disease free zones and zero disease concept.

#### **UNIT IV**

Molecular basis of a disease, application of nucleic acid based assays for genomic characterization of field isolates vis-a-vis vaccine strains.

#### **Practical**

Design proforma questionnaires for collection of information on health and diseases in populations, sero-surveys for important diseases of livestock and poultry, investigation of outbreaks, use of computer software in epidemiology.

#### **Suggested Readings**

Martin SW, Meek AH & Willeberg P. 1993. *Veterinary Epidemiology:*

*Principles and Methods*. IBH. Thrusfield M. 2004. *Veterinary Epidemiology*. 8<sup>th</sup> Ed. Blackwell. Thomas B. (Ed.). *Applied Veterinary Epidemiology*. Elsevier.

#### **VEP 603: LIVESTOCK AND POULTRY DISEASE INVESTIGATION**

**0+2**

**Objective** :To expose students to actual field based investigations of diseases in livestock and poultry.

#### **Practical**

To attend outbreaks of infectious diseases and toxicological conditions in livestock and poultry in the field and at farms. Recording and analysis of data. Investigation and diagnosis on dead and live diseased animal(s) and poultry. Collection, preservation and transport of material in the face of disease outbreak, and processing of material in the laboratory for diagnosis; screening of animal herds and poultry flocks for certain important diseases. Formulating and advising treatment and control measures. Extraction and isolation of nucleic acid of field isolates and vaccine strains, and their characterization by PCR and other techniques.

#### **Suggested Readings**

Vihan VS. 2002. *Modern Veterinary Laboratory Techniques in Clinical Diagnosis*. CBS.

#### **VEP 604: VETERINARY CLINICAL EPIDEMIOLOGY**

**1+1**

**Objective** :To familiarize students with various epidemiological approaches for solving field problems.

#### **Theory**

#### **UNIT I**

Definitions and epidemiological approaches, measuring frequency of clinical events, incidence, prevalence, occurrence etc., principles of accuracy, precision, linearity, diagnostic sensitivity and specificity.

#### **UNIT II**

Uses of diagnostic tests, evaluation of diagnostic tests, cohort and case control studies.

#### **UNIT III**

Design and evaluation of clinical trials, cost of disease, cost benefit analysis.

#### **Practical**

Diseases of multiple etiology: mastitis, diarrhea, abortions and their diagnosis and prevention. Sampling, isolations and antibiotic/ culture sensitivity etc. statistical evaluation of diagnostic assays.

#### **Suggested Readings**

Smith RD. 2005. *Veterinary Clinical Epidemiology - a Problem Oriented Approach*. 3<sup>rd</sup> Ed. Taylor & Francis, CRC.

#### **VEP 605: BIOSECURITY PRACTICES IN DISEASE PREVENTION**

**1+1**

**Objective** : To facilitate learning concepts of disinfection, sterilization and vaccination for disease prevention.

#### **Theory**

#### **UNIT I**

Definition and principles of biosecurity, shedding of pathogens by infected animals, their survival in the environment, routes of entry and transmission of pathogens.

#### **UNIT II**

Protection of susceptible animals, interruption of pathways of transmission, role of disinfection to break cycle of infection.

#### **UNIT III**

Chemical disinfectants, microbial resistance to disinfectants, physical methods of disinfection and sterilization.

#### **UNIT IV**

Biosecurity measures for collection of specimen from wild animals. Vaccines- success stories of disease eradication through vaccination.

#### **Practical**

Practical use of disinfectants in destruction of microbes in laboratory and under field conditions. Determination of efficacy/phenol coefficient of commonly used disinfectants. Measurement of vaccine titres.

#### **Suggested Readings**

Linton AH, Hugo WB & Russell AD. 1987. *Disinfection in Veterinary and Farm Animals Practice*. Blackwell.

#### **VEP 606: INFECTIOUS DISEASES OF RUMINANTS – I**

**2+1**

**Objective**: To supplement cognitive learning with regard to recent progress made in the areas of etiology, pathogenesis, epidemiology, symptomatology, diagnosis, treatment and control of bacterial and fungal diseases of bovine, sheep and goats.

#### **Theory**

#### **UNIT I**

Mastitis, joint ill, ulcerative lymphangitis, anthrax, clostridial infections, black quarter, tetanus, bacillary haemoglobinuria, botulism, colibacillosis.

## **UNIT II**

Pasteurellosis, listeriosis, campylobacteriosis, tuberculosis, Johne's disease, braxy, entero-toxaemia, brucellosis, salmonellosis, leptospirosis.

## **UNIT III**

Actinomycosis, actinobacillosis, ringworm, cutaneous streptothricosis, sporotrichosis, aspergillosis, coccidiomycosis, rhinosporidiosis, mucormycosis, histoplasmosis, candidiasis, blastomycosis etc.

### **Practical**

Application of latest diagnostic/serological tests and adoption of preventive measures for the control of various bacterial and fungal diseases of bovine, sheep and goats.

### **Suggested Readings**

Radostits OM, Gay CC, Blood DC & Hinchcliff KW. 2006. *Veterinary Medicine, a Text Book of Diseases of Cattle, Sheep, Pigs, Goats and Horses*. Book Power.

## **VEP 607: INFECTIOUS DISEASES OF RUMINANTS – II**

**2+1**

**Objective:** To supplement cognitive learning with regard to recent progress made in the areas of etiology, pathogenesis, epidemiology, symptomatology, diagnosis, treatment and control of viral, rickettsial and parasitic diseases of bovine, sheep and goats.

### **Theory**

#### **UNIT I**

Foot and mouth disease, vesicular stomatitis, vesicular exanthema, rinderpest, PPR, bovine viral diarrhea, mucosal disease, ephemeral fever, bovine herpes virus-1 induced syndromes, leucosis, viral pneumonia, pox diseases, infectious gastro-enteritis of viral etiology.

#### **UNIT II**

Bovine malignant head catarrh, rabies, scrapie, blue tongue, louping ill, papillomatosis.

#### **UNIT III**

Bovine tropical theileriosis, babesiosis, anaplasmosis, trypanosomiasis, toxoplasmosis, coccidiosis.

#### **UNIT IV**

Sarcocystosis, fascioliosis, amphistomiasis, gastro-intestinal nematodiosis, schistosomiasis, verminous bronchitis, echinococcosis, coenurosis, tape worm infestations.

### **Practical**

Application of latest diagnostic and serological tests for establishing disease diagnosis, designing preventive and control measures against major diseases of veterinary importance caused by viruses, rickettsiae, helminth parasites and blood protozoa.

### **Suggested Readings**

Radostits OM, Gay CC, Blood DC & Hinchcliff KW. 2006. *Veterinary Medicine, a Text Book of Diseases of Cattle, Sheep, Pigs, Goats and Horses*. Book Power.

## **VEP 608: INFECTIOUS DISEASES OF EQUINES**

**1+1**

**Objective:** Learning of important infectious diseases of equines; their diagnosis, prevention and control.

### **Theory**

#### **UNIT I**

Anthrax, tetanus, botulism, strangles, glanders, malignant edema, actinomycosis, clostridial infections, *Rhodococcus equi* pneumonia (Zoonotic), tuberculosis.

#### **UNIT II**

African horse sickness, infectious equine anaemia, equine influenza, equine encephalomyelitis, rabies, equine viral rhinopneumonitis, equine viral arteritis vesicular stomatitis, ulcerative lymphangitis.

Trypanosomiasis/ dourine, babesiosis, parasitic pneumonia.

#### **UNIT IV**

Cutaneous eczema, cutaneous acne, cutaneous pustular dermatitis, candidiasis, histoplasmosis, coccidiomycosis, dermatophytosis.

### **Practical**

Diagnostic tests and serological tests for study of epidemiology of infectious diseases of equines.

### **Suggested Readings**

Robison NE. 1997. *Current Therapy in Equine Medicine*. WB Saunders. Wintzer HJ. 1986. *Equine Diseases, a Text Book for Students and Practitioners*. Verlag Paul Parcey.

## **VEP 609: INFECTIOUS DISEASES OF CANINES AND FELINES**

**2+1**

**Objective:** Learning of etiology, epidemiology, pathogenesis, symptomatology, diagnosis and treatment of infectious diseases of dogs and cat.

### **Theory**

#### **UNIT I**

Bacterial diseases: salmonellosis, campylobacteriosis, mycobacteriosis, actinomycosis, nocardiosis, streptococcosis, leptospirosis, borreliosis, tetanus, botulism. Viral diseases: canine distemper, infectious canine hepatitis, parvovirus infection, rabies, infectious tracheo-bronchitis, corona virus infection.

## **UNIT II**

Feline diseases: feline pan-leucopaenia, feline infectious peritonitis, feline herpesvirus, feline spongiform encephalopathy, feline calci virus, feline immuno-deficiency virus (FIV).

## **UNIT III**

Toxoplasmosis, neosporosis, sarcoptic mange, demodectic mange, hookworm and toxocara canis infections, leishmaniasis, canine babesiosis, ehrlichiosis, hepatozoonosis.

### **Practical**

Assignments, recent diagnostic/ serological tests for the diagnosis of important diseases of dogs and cats. Vaccination schedule for various diseases. Collection of material from clinical cases.

### **Suggested Readings**

Dunn JK. 1999. *Text Book of Small Animal Medicine*. WB Saunders. Ettinger SJ & Feldman EC. 2000. *Text book of Veterinary Internal Medicine*. 5<sup>th</sup> Ed. WB Saunders. Gormann NT. 1998. *Canine Medicine and Therapeutics*. Blackwell. Tilley LP & Smith FWK Jr. 2004. *The 5-minute Veterinary Consult (Canine and Feline)*. 3<sup>rd</sup> Ed. Lippincot, Williams & Wilkins.

## **VEP 610: INFECTIOUS DISEASES OF POULTRY**

**2+1**

**Objective:** Learning of etio-pathology, diagnosis, prevention and control of important infectious diseases of poultry.

### **Theory**

#### **UNIT I**

Impact of diseases on poultry industry, mechanism of disease transmission. Bacterial diseases: *Escherichia coli* and *Salmonella* infections, coryza, fowl cholera, gangrenous dermatitis, mycoplasmosis, CRD.

#### **UNIT II**

Viral diseases: Newcastle disease, infectious bursal disease, Marek's disease, infectious bronchitis, inclusion body hepatitis, hydro-pericardium syndrome, avian pox, infectious laryngo-tracheitis, avian influenza, lymphoid leucosis, avian encephalomyelitis, infectious bronchitis.

#### **UNIT III**

Fungal and parasitic diseases: aspergillosis, candidiosis, favus, mycotoxicosis, coccidiosis, roundworm and tape worm infestations, vaccination schedule etc.

### **Practical**

Postmortem examination of poultry birds, collection of material for isolation, antibiotic sensitivity assay, histopathology and demonstration of other routine diagnostic tests. Seromonitoring for important diseases and pullorum testing.

### **Suggested Readings**

Calnek BW, Barnes HA, Beard CW, Reid WM & Yoder HW Jr. 1994. *Diseases of Poultry*. 10<sup>th</sup> Ed. Iowa State Univ. Press. Jordan FTW & Pattison M. 1996. *Poultry Diseases*. WB Saunders.

## **VEP 611: INFECTIOUS DISEASES OF ANIMAL SPECIES OF REGIONAL IMPORTANCE (CAMEL AND SWINE)**

**2+1**

**Objective:** Learning of diseases of animals which are important to the particular region i.e. swine, camel, yak, mithun, elephant etc. e.g., in Haryana, swine and camel diseases will be taught to the students.

### **Theory**

#### **UNIT I**

Specific diseases of camel e.g. kapali, malli, jhooling, pica, satyriasis, specific peritonitis, kumree, chronic peritonitis.

#### **UNIT II**

General infectious diseases: anthrax, actinomycosis, black quarter, bronchitis, coccidiosis, contagious echthyma, haemorrhagic septicaemia, hydatidosis, mange, mastitis, camel pox, rabies, surra, tuberculosis etc.

#### **UNIT III**

Swine diseases: Swine influenza, hog cholera, African swine fever, swine pox, vesicular exanthema, vesicular stomatitis, rabies.

#### **UNIT IV**

Porcine enteroviruses, pseudorabies, listeriosis, leptospirosis, brucellosis, anthrax, salmonellosis, swine erysipelas, pasteurellosis, tuberculosis mange etc.

### **Practical**

Recent diagnostic tests and preventive measures for the control of infectious diseases of swine and camel. Investigations of outbreaks. Visits to organized farms.

### **Suggested Readings**

Dunne HW & Leman AD. (Eds.). 1978. *Diseases of Swine*. Iowa State Univ. Press.  
Gahlot TK & Singh J. 2002. *Selected Topics on Camelids*. Camel Publishing House.  
Kohler I, Rollfeson E & Evelyn M. 2001. *Field Manual of Camel Diseases: Traditional and Modern Health Care of Dromedary*.  
Radostits OM, Gay CC, Blood DC & Hinchcliff KW. 2006. *Veterinary Medicine: A Text Book of Diseases of Cattle, Sheep, Pigs, Goats and Horses*. Book Power.  
Wernery U & Kaden M. 2002. *Infectious Diseases of Camelids*. Blackwell.

## **VEP 612: INFECTIOUS DISEASES OF LABORATORY AND ZOO ANIMALS**

**1+0**

**Objective:** Learning of specific diseases of laboratory and zoo animals which will help in understanding, and managing them in good health and employing good sanitation and bio-security measures.

## **UNIT I**

Specific diseases of laboratory animals caused by bacteria, viruses, fungi and parasites.

## **UNIT II**

Specific diseases of zoo (captive) animals caused by bacteria, viruses, fungi and parasites.

### **Suggested Readings**

Joshi BP. 1991. *Wild Animal Medicine*. Kalyani.

Fowler ME. 1986. *Zoo and Wild Animal Medicine*. 2<sup>nd</sup> Ed. WB Saunders. Fox JG, Anderson LC, Loew FM & Quimby FW. (Eds.). 2004. *Laboratory*

*Animal Medicine*. 2<sup>nd</sup>Ed. Baker HJ. 1978. *Pathology of Laboratory Animals*. Springer, New York Hafez ESE. (Ed.). *Reproduction and Breeding Techniques for Laboratory*

*Animals*. Lea and Fabiger, Philadelphia. Sirois M. 2005. *Laboratory Animal Medicine: Principles and Procedures*. 2<sup>nd</sup> Ed. Elsevier.

Hrapkiewicz K. 2007. *Clinical Laboratory Animal Medicine - An Introduction*. 3<sup>rd</sup> Ed. Blackwell Publ.

Radostits OM, Gay CC, Blood DC & Hinchcliff KW. 2006. *Veterinary Medicine: A Text Book of Diseases of Cattle, Sheep, Pigs, Goats and Horses*. Book Power.

## **VEP 701: RECENT CONCEPTS IN EPIDEMIOLOGY AND DISEASE FORECASTING**

**2+1**

**Objective:** To learn about different epidemiological aspects of major diseases and to develop suitable disease forecasting system.

### **Theory**

#### **UNIT I**

Review of epidemiological concepts and applications, recent concepts.

Epidemiology of economically important diseases in the region (haemorrhagic septicemia, foot and mouth disease, surra, brucellosis, PPR, swine fever, IBD and fowl typhoid).

#### **UNIT III**

Geographical Information System and its applications in epidemiology, various expert systems and their role in epidemiology.

#### **UNIT IV**

Modeling and application of various models in disease forecasting. Epidemiological software.

### **Practical**

Epidemiology exercises of economically important diseases in the region, use of Geographical Information System in epidemiology, various expert systems, modeling and various models used in disease forecasting, use of various epidemiological softwares.

### **Suggested Readings**

Noordhuizen JPTM, Franklin K, Thrusfield MV & Graat EAM. 2003. *Application of Quantitative Methods in Veterinary Epidemiology*. IBD.

## **VEP 702: HERD HEALTH MANAGEMENT**

**2+1**

### **Objective**

Adoption of holistic approach to address issues of herd health without affecting production.

### **Theory**

#### **UNIT I**

General principles, interactions between health and production.

#### **UNIT II**

Dairy cattle: mastitis control and health management of dairy cows and calves.

#### **UNIT III**

Health and production in swine, sheep, goats and poultry.

### **Practical**

Visit to farms, assessment of their problems, systematic programme or control of a specific disease and its impact.

### **Suggested Readings**

Radostits & Blood DC. 1996. *Herd Health*. Book Power.

## **VEP 703: DATA COLLECTION, MANAGEMENT AND PRESENTATION**

**2+1**

**Objective:** To apprise the students of importance of data collection, analysis and interpretation for effective disease control.

### **Theory**

#### **UNIT I**

Classification of data, sources of data, data collection, questionnaires.

#### **UNIT II**

Data storage, computerized and non-computerized recording techniques.

Application of computing and internet based records. Veterinary recording schemes, veterinary information systems and databases.

#### **UNIT IV**

Presenting numerical data: some basic definitions. Displaying numerical data.

### **Practical**

Collection, storage and analysis of data of Disease Investigation Laboratories of department, Veterinary hospitals, livestock and poultry farms etc. Development of suitable software for the same. Pie charts, graphs and maps for presentation of data.

**Suggested Readings**

Noordhuizen JPTM, Frankena K, Thrusfield MV & Gruat EAM. 2003. *Application of Quantitative Methods in Veterinary Epidemiology*. International Book Distr. Co.

**VEP 704: SURVEY AND SURVEILLANCE**

**2+1**

**Objective:** To demonstrate different methodologies and procedures involved in conducting survey and surveillance.

**Theory**

**UNIT I**

Over-view of concepts of survey and surveillance, purpose and method of sampling, size of sample, questionnaires.

**UNIT II**

Goals and types of surveillance, difference from monitoring, mechanism of surveillance and surveillance network.

**UNIT III**

Disease/data recording and reporting.

**Practical**

Develop questionnaires on selective topics, Survey among livestock and poultry farmers to find out usefulness/effectiveness of vaccination/ artificial insemination/ other practices, surveillance of important diseases in different parts of state.

**Suggested Readings**

Selected articles from journals.

**VEP 705: EMERGING AND RE-EMERGING ANIMAL DISEASES**

**2+0**

**Objective:** To create awareness about emerging and reemerging diseases and surveillance methods.

**Theory**

**UNIT I**

General concepts for emergence of new diseases and re-emergence of old diseases.

**UNIT II**

Epidemiology of globally and nationally important emerging/re-emerging diseases and designing of strategies for their prevention and control.

**Suggested Readings**

Selected articles from journals.

**VEP 706: ECOLOGY OF DISEASES**

**2+0**

**Objective:** To make the students aware about ecology, ecological systems and impact of global warming.

**Theory**

**UNIT I**

Basic ecological concepts, distribution and regulation of population size, the niche with examples.

**UNIT II**

Ecosystems, biotope, landscape epidemiology, nidity.

**UNIT III**

Patterns of disease, epidemic curves (Reed-Frost-model, Kendall's waves), trends in temporal and spatial distribution of disease.

**UNIT IV**

Global warming, its impact on animal health, pathogens/vectors and changing disease patterns.

**Suggested Readings**

Selected articles from journals.

**VEP 707: MOLECULAR APPROACHES IN EPIDEMIOLOGY**

**2+1**

**Objective:** Learning of recent advanced molecular techniques for establishing disease diagnosis.

**Theory**

**UNIT I**

The concept of molecular basis of a disease, molecular determinants of pathogenicity of infectious agents and their transmissibility to susceptible populations of livestock and poultry.

**UNIT II**

Laboratory biosafety, antigenic, genetic and biological characterization of field isolates of pathogens incriminated in field outbreaks, differentiation of field and vaccine strains, the concept of marker vaccines, and correlation of pathotypes and genotypes of a pathogen.

**UNIT III**

Immunological tests, immunoblotting techniques and use of monoclonal antibodies in different ELISAs for antigenic analysis. Application of nucleic acid based assays viz. polymerase chain reaction (PCR) assays, nucleotide sequencing, restriction endonuclease analysis and RFLP analysis for genomic characterization using the field material directly or after extraction of nucleic acid from small scale cultures, use of radio-actively labeled or non radioactive oligo-nucleotide probes in dot-blot and Southern hybridizations.

**Practical**

Extraction and isolation of nucleic acid from field isolates of the causative pathogens, digestion with restriction endonucleases and electrophoresis in agarose gel in order to obtain fingerprints and their comparative analysis. SDS-PAGE for protein profiling. Western blotting, ELISA for screening of field samples.

#### **VEP 708: ADVANCES IN PREVENTION AND CONTROL OF INFECTIOUS DISEASES OF RUMINANTS 2+1**

**Objective** :To understand advancements made in the field of etiology, pathogenesis, epidemiology, symptomatology, diagnosis, treatment and control of diseases of ruminants.

##### **Theory**

##### **UNIT I**

Bacterial diseases of economic importance in bovines, sheep and goats.

##### **UNIT II**

Viral diseases of economic importance in bovines, sheep and goats.

##### **UNIT III**

Fungal diseases of economic importance in bovines, sheep and goats.

##### **UNIT IV**

Blood protozoan and rickettsial diseases of economic importance in bovines, sheep and goats.

##### **UNIT V**

Parasitic diseases of economic importance in bovines, ovines and caprines.

##### **Practical**

Latest diagnostic and serological tests for establishing disease diagnosis, designing preventive and control measures for major diseases of veterinary importance caused by bacteria, viruses, fungi, rickettsiae, parasites and protozoa.

##### **Suggested Readings**

Radostits OM, Gay CC, Blood DC & Hinchcliff KW. 2006. *Veterinary*

*Medicine: A Text Book of Diseases of Cattle, Sheep, Pigs, Goats and Horses*. Book Power.

#### **VEP 709: ADVANCES IN PREVENTION AND CONTROL OF INFECTIOUS DISEASES OF EQUINES 2+1**

**Objective** :To train students in learning and practicing advancements made in the field of prevention and control of important infectious diseases of equines.

##### **Theory**

##### **UNIT I**

Bacterial diseases of economic importance in equines.

##### **UNIT II**

Viral diseases of economic importance in equines.

##### **UNIT III**

Fungal diseases of economic importance in equines.

##### **UNIT IV**

Blood protozoan and rickettsial diseases of economic importance in equines.

##### **UNIT V**

Parasitic diseases of economic importance in equines.

##### **Practical**

Latest diagnostic and serological tests for establishing disease diagnosis, designing preventive and control measures against major diseases of veterinary importance caused by viruses, rickettsiae and protozoa.

**Suggested Readings** :Selected articles from journals.

#### **VEP 710: ADVANCES IN PREVENTION AND CONTROL OF DISEASE IN PET ANIMALS 2+1**

**Objective** : To get students acquainted with advancements made in the field of prevention and control of important infectious diseases of pet animals.

##### **Theory**

##### **UNIT I**

Bacterial diseases of economic importance in pet animals.

##### **UNIT II**

Viral diseases of economic importance in pet animals.

##### **UNIT III**

Fungal diseases of economic importance in pet animals.

##### **UNIT IV**

Blood protozoan and rickettsial diseases of economic importance in pet animals.

##### **UNIT V**

Parasitic diseases of economic importance in pet animals.

##### **Practical**

Latest diagnostic and serological tests for establishing disease diagnosis, designing preventive and control measures against major diseases of pet animals caused by bacteria, viruses, fungi, rickettsiae, parasites and protozoa.

**Suggested Readings**: Selected articles from journals.

**VEP 711: ADVANCES IN PREVENTION AND CONTROL OF DISEASES IN POULTRY**

**2+1**

**Objective :** To impart knowledge about latest advancements made in the field of prevention and control of important infectious diseases of poultry.

**Theory**

**UNIT I**

Bacterial diseases of economic importance in poultry.

**UNIT II**

Viral diseases of economic importance in poultry.

**UNIT III**

Fungal diseases of economic importance in poultry.

**UNIT IV**

Parasitic diseases of economic importance in poultry.

**Practical**

Latest diagnostic and serological tests for establishing disease diagnosis, designing preventive and control measures against major diseases of veterinary importance caused by bacteria, viruses, fungi and other parasites.

**VEP 790: SPECIAL PROBLEM Objective**

**0+2**

**Objective:** To provide expertise in handling practical research problems.

**Practical**

Short research problems involving contemporary issues and research techniques.