DEPARTMENT OF VETERINARY MICROBIOLOGY

SEMESTER-III

GENERAL VETERINARY MICROBIOLOGY

VMC-211 **Credit Hours 1+1=2**

THEORY

Introduction and history of Microbiology. Morphology, structure, growth and nutrition of bacteria.Classification and nomenclature of bacteria. Sources and transmission of infection. Pathogenicity, virulence and infection. Resistance and susceptibility of host bacteraemia, septicaemia, toxaemia. endotoxins and exotoxins; Bacterial genetics. Plasmids, Antibiotic resistance.

Introduction, morphology, growth, nutrition, reproduction in fungi, Classification of fungi.

Introduction to viruses: General properties, Replication, Cultivation and Purification of viruses. Cell-Virus interactions. Viral genetics. Interferon,

PRACTICAL

Equipment, Sterilization, disinfection and asepsis, Staining (simple & Grams, acid fast, lactophenol cotton blue), Special staining (metachromatic granules, capsular, spore). Bacterial motility, Preparation of culture media. Aerobic and anaerobic cultivation, Isolation of bacteria in pure culture, Morphological and cultural characteristics, biochemical characters, Antibiogram, Phenol coefficient test, Slide culture technique for fungus.

REFERENCE BOOKS

1. Microbiology – 4th ed. Prescott, Herley and Klein
2. Practical Medical Microbiology – Collee, Dugid, Frazer and Marnion
3. Veterinary Virology – Murphy, Gibbs, Horzineck and Studert

SEMESTER -IV

VETERINARY IMMUNOLOGY AND SEROLOGY

VMC- 221 **Credit Hours 1+1=2**

THEORY

Concepts in Veterinary and Medical Immunology. Immune system: organs, tissues and cells. Types of immunity. Development of humoral and cellular immune responses.

Antigens: definition, specificity, types and factors affecting immunogenicity, blood group antigens. Antibodies: Structure, properties and function of different classes of immunoglobulins, Site, mechanism and theories of antibody production, Monoclonal antibodies.

Major histocompatibility complex, Complement system; Cytokines: Major types and functions. Serological reactions: Agglutination, precipitation, haemagglutination; Phagocytosis, opsonic index, cytolysis; Complement fixation, neutralization, toxin and antitoxin reaction, immunofluorescence; Hypersensitivity: classification and mechanism of induction. Autoimmunity and immunotolerance. Immunisation of animals.

Biologicals: Role of conventional and modem vaccines in immunoprophylaxis. Adjuvants. Quality control of biologicals.

PRACTICAL

Preparation of antigen, Raising of antisera, Concentration of Immunoglobulins, Agglutination (plate, tube). Precipitation {Agar gel precipitation test (AGPT), Crossed immunoelectrophoresis (CIE), Rocket Immunoelectrophoresis (RIE), Indirect agglutination (Latex co-agglutination, Passive haemagglutination (PHA), Reversed passive haemagglutrnarion (RPHA)}, Haemagglutination, Complement fixation test, immunoperoxkJase test (IPT), Fluorescent antibody technique (FAT), Enzyme linked immunosorbent assay (ELISA), Cell mediated immune (CMI) response. Veterinary biologicals (visits and appraisal).

REFERENCE BOOKS

1. Veterinary Immunology – 7th ed. Tizard
2. Immunology – Janus Kuby
3. Immunology – Ivan Roitt

SEMESTER- V

SYSTEMATIC VETERINARY BACTERIOLOGY AND MYCOLOGY

VMC- 311 **Credit Hours 2+1=3**

THEORY

Study of following important pathogenic bacteria and fungi in relation to their morphology, isolation, growth, colonial, biochemical and antigenic characters. Pathogenicity and diagnosis of bacterial and fungal diseases caused by the following genera:

Bacteria: *Staphylococcus, Streptococcus, Bacillus, Clostridium, Mycobacterium, Enterobacteriaceae (E.coii, Salmonella, Yersinia, Klebsiella and Proteus), Campylobacter, Brucella, Pasteurella and Mannheimia, Pseudomonas and Burkholderia, MoraxeUa, Haemophilus and Taylorella, Listeria, ActtnobacHius. Actinomyces. Arcanobacterium and Corynabactehum, Nocardia, DermatophHus, Spirochetes, Gram negative anaerobes. Mycoplasma, Rickettsia, Chlamydia and ChlamydophHa.* Fungi: Dermatophytes, *Rhinosporidium, Sporothchum, Candida,* Mycetomal fungi. *Cryptococcus, Aspergillus,* Zygomycetes and Dimorphic fungi. Mycotic mastitis and abortion. Mycotoxicoses.

PRACTICAL

Laboratory identification of agents of Mastitis, Haemorrhagic septicaemia. Enteric infections. Brucellosis. Tuberculosis and Johne's disease, Clostridial infections, Wooden tongue and Lumpy jaw, Anthrax, Glanders, AspergiWosis. Dermatophytosis, Demonstration of other agents of importance (Phycomycetes, yeasts etc.).

REFERENCE TEXTBOOKS

1. Veterinary Microbiology – Dwight C. Hirsh
2. Veterinary Microbiology & microbial diseases – Qiunn, Markey & Carter
3. Clinical Veterinary Microbiology - Qiunn & Carter
4. Essentials of Veterinary Microbiology – Carter & Wise

SEMESTER- VI

SYSTEMATIC VETERINARY VIROLOGY

VMC- 321 **Credit Hours 2+1=3**

THEORY

Brief history, classification and characteristics of various families of DNA and RNA viruses causing diseases in livestock and poultry, laboratory diagnostic techniques, immunity to viral infections, systemic virology including: DNA viruses: **Poxviridae:** Pox viruses of cow, sheep, goat and fowl **Asfarviridae** African swine fever, **Herpesviridae:** Aujeszky's disease, malignant catarrhal fever, infectious bovine rhinotracheitis, equine abortion. Marek's disease, infectious laryngeotracheitis. **Adenoviridae** - Infectious canine hepatitis, egg drop syndrome (EDS), Inclusion body fiepatitis-Hydropericardium syndrome (IBH-HPS). **Papillomaviridae:** Papillomatosis, **Parvoviridae**: Canine Parvovirus. **Circoviridae:** Chicken infectious anaemia. RNA viruses: **Orhomyxoviridae:** Swine, equine and Avian influenza. **Paramyxoviridae:** Rinderpest, PPR, canine distemper and Ranikhet disease, **Flavivirldae:** Classical swine fever, bovine viral diarrhoea. **Piconaviridae:** - foot and mouth disease (FMD), duck viral hepatitis, **Rhabdoviridae:** - Rabies, vesicular stomatitis, ephemeral fever, **Coronaviridae:** - Avian Infectious bronchitis, transmissible gastroenteritis, **Togaviridae**: - Equine encephalitis, Arteriviridae: equine viral arteritis, Callclvlridae: vesicular exanthema, **Retroviridae:** Avian leucosis group. Lentlviruses- Equine infectious anemia virus, Sheep pulmonary adenomatosis, MaeduVisna. **Reoviridae:** African horse sickness and blue tongue, Calf Rotavirus, **Birnaviridae:** Infectious bursal disease. Prions, Exotic and emerging animal and poultry viruses.

PRACTICAL

Glassware and media preparation, Demonstration of Cell culture, virus propagation by egg inoculation, animal inoculation and cell culture, study of cytopathogenesis, viral inclusions, diagnostic procedures, serological techniques, preservation and transportation of clinical samples for virological investigations. Diagnostic procedures for Peste des petits ruminants (PPR), FMD, Ranikhet disease (RD), Blue tongue, Infectious bronchitis (IB), Infectious bursal disease (IBD) and other viral agents.

REFERENCE BOOKS

1. Veterinary Virology – Murphy, Gibbs, Horzineck and Studert
2. Essentials of Veterinary Microbiology – Carter & Wise
3. Veterinary Microbiology & microbial diseases – Qiunn, Markey & Carter
4. Veterinary Microbiology – Dwight C. Hirsh