

**Core Course II (CC) – Virology**

**Unit I – General Virology**

Brief outline on discovery of viruses, nomenclature and classification of viruses; Distinctive properties of viruses; morphology & ultrastructure. Capsids and their arrangements - types of envelopes and their composition-viral genome, their types and structures. Virus related agents (viroids, prions).

**Unit II – General Methods of Diagnosis and Serology**

Cultivation of viruses in embryonated eggs, experimental animals, and cell cultures. Primary & secondary cell cultures and monolayer cell cultures; cell strains, cell lines and transgenic systems. Serological methods – haemagglutination & HAI; complement fixation; immunofluorescence methods, ELISA and radioimmunoassays. Assay of viruses – physical and chemical methods (protein, nucleic acid, radioactivity tracers, electron microscopy). Infective assay (plaque method, end point method) – Infectivity assay of plant viruses.

**Unit III – Bacterial Viruses**

Bacteriophage - structural organization - life cycle -DNA replication - eclipse phase - phage production - burst size; lysogenic cycle. Brief details on M13, Mu, T4, Lambda and P1.

**Unit IV – Plant Viruses**

Classification and nomenclature; effects of viruses on plants; Common virus diseases of plants - paddy and sugarcane. Type species of plant viruses TMV, Cauliflower Mosaic Virus and Potato Virus X; Transmission of plant viruses with vectors - insects, nematodes, fungi - without vectors (contact, seed and pollens). control measures of plant viruses- generation of virus-free planting material; vector control.

**Unit V – Animal Viruses**

Classification and nomenclature of animal human viruses. Epidemiology, lifecycle, pathogenicity, diagnosis, prevention and treatment of RNA Viruses - Picorna, Orthomyxo, Paramyxo, Rhabdo, Rota, HIV - Oncogenic viruses. DNA viruses; Pox, Herpes, Adeno, SV 40; Hepatitis viruses. Viral vaccines (including DNA Vaccines with examples) interferons, and antiviral drugs.

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