



Virology

Course Code	Course Num.	Course Name	Credit Hours	Lec	Lab	Tut	Prerequisites
BIO	345	Virology	4	3	2	0	BIO242

Objectives:

By the end of this course the student will be able :

- To have the scientific background about virus structure and replication, their pathogenesis, host immune responses against them, and their control.
- To know how to deal with samples containing viral particles, the method used for virus isolation.
- To deal with the common viral diseases that affect animal and poultry flocks, regarding laboratory diagnosis, prevention and control.
- To recognize The multiplicity of virus transmission factors.
- To Compare human diseases, animals and plants by viruses.
- To clarify the role of viruses in transforming normal cells into cancerous.
- To remember the role of viruses in the vaccination and immunization.

Syllabus:

- Discovery of viruses, nature and definition of viruses, general properties of viruses.
- Concept of viroids, virusoids, satellite viruses and prions.
- Theories of viral origin
- Structure of viruses, Capsid symmetry, enveloped and non-enveloped viruses
- Isolation, purification and cultivation of viruses.
- Viral Taxonomy, Classification and nomenclature of different groups of viruses infecting microbes, plants and animals, Salient features of viral genomes .
- Unusual bases (TMV, T4 phage), overlapping genes (Φ X174, Hepatitis B virus), alternate splicing (Picornavirus), terminal redundancy (T4 phage), terminal cohesive ends (lambda phage), ambisense genomes (arenavirus), partial double stranded genomes (Hepatitis B), long terminal repeats (retrovirus), segmented (influenza virus) and non segmented genomes (picornavirus), capping and tailing (TMV).
- Bacteriophages Diversity, classification, one step multiplication curve, lytic and lysogenic phages , (lambda and P1 phage), concept of early and late proteins, regulation of transcription ,in lambda phage and applications of bacteriophages.
- Viral multiplication and replication strategies .
- Interaction of viruses with cellular receptors and entry of viruses.Replication strategies of viruses as per Baltimore classification.
- Assembly, maturation and release of virions.
- Concept of defective particles,Transmission of viruses . Persistent and non-persistent mode, Oncogenic viruses , Types of oncogenic DNA and RNA viruses.
- Concepts of oncogenes, proto24, oncogenes and tumor suppressor genes
- Prevention and control of viral diseases .
- Antiviral compounds, interferons and viral vaccines.
- Applications of Virology, Use of viral vectors in cloning and expression.
- Gene therapy and Phage display

References:

- John Carter , Virology : Principles and applications, (2014) ,2nd ed.ISBN: 13: 97811999142.
- Alan J. Cann Principles of Molecular Virology, 6th Edition (2015). ISBN-13: 978-0128019467 .