

VANITA VISHRAM WOMEN'S UNIVERSITY

SCHOOL OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF BIOTECHNOLOGY



**VANITA VISHRAM
WOMEN'S UNIVERSITY**

SURAT

**BACHELOR OF SCIENCE (B.Sc.) HONOURS IN
BIOTECHNOLOGY**

**Under Learning Outcomes Based Curriculum Framework
(LOCF)**

For Undergraduate (UG) Education

SEMESTER - 4

Skill Enhancement Course (SEC)

**Syllabus applicable to the students seeking admission in the
following Program**

B.Sc. Biotechnology under LOCF w.e.f. the Academic Year

2021-2022

BACHELOR OF SCIENCE (B.SC.) BIOTECHNOLOGY HONOURS

SEMESTER 4

SKILL ENHANCEMENT COURSE PAPER 2

VIROLOGY

Course Objectives:

- To provide students with an introduction to viruses and their importance in nature.
- To enable the students to understand about various viral diseases of plants and human being.

Course Outcome:

- Basic principles of virology, structure, replication strategies, General method for cultivation and to identify viruses, viral vaccine and antiviral drugs and its importance to society.
- Structural organization and life cycle of bacteriophage, viruses of other organism.
- General characters, morphology, transmission, epidemiology, symptoms and control of plant viruses.
- Etiology, symptoms, pathogenic mechanisms, lab diagnosis, treatment, epidemiology, prevention and control of viruses important to human.

BT15020 - THEORY COURSE CONTENT

(4 Credits)

UNIT 1

Introduction to virology: Brief outline of virology, Theories of viral origin, The early period and the modern period History & Development of concepts of viruses, General properties of viruses, Virus Morphology , Taxonomy & Classification of Viruses: General taxonomy, The Baltimore system of classification, ICTV system for taxonomy, Viral cultivation and assay: Initial detection and isolation, Hosts for virus cultivation, Recognition of viral growth in culture, Virus cultivation, Quantitative assay, Viral hemagglutination, Viral multiplication, Assay of infectivity, General methods of diagnosis and serology, Virioids, Prions, Satellite RNAs and virusoids, Viral vaccines and antiviral agents

**15
lectures**

UNIT 2	Bacterial Viruses: Genome, structural organization and Life cycle of Φ X174, M13, T4 and lambda, Temperate & Virulent Phages, Phage-borne genes for bacterial toxins & other proteins affecting host phenotype, Multiplication/Replication: Lytic & Lysogenic cycles, One step growth curve	15 lectures
UNIT 3	Plant viruses, General characters, morphology, transmission, epidemiology, symptoms and control of following plant viruses: Tobacco mosaic virus,, Cauliflower mosaic virus, Rice tungro virus, Tomato leaf curl virus, Sugarcane mosaic virus, Potato virus Y & X, Cassava mosaic virus, Tomato spotted wilt virus, Cotton leaf curl virus	13 lectures
UNIT 4	Human viruses, Etiology, symptoms, pathogenic mechanisms, lab diagnosis, treatment, prevention and control for the following virus important to human: DNA viruses, Adeno viruses, Herpes viruses (1 & 2), Papilloma virus, Hepatitis B viruses, RNA viruses, Influenza virus, Rabies virus, Corona virus, HIV, Oncolytic viruses	12 lectures

SUGGESTED READING

1. Ananthanarayan R and Jeyaram Paniker CK. *Text Book of Microbiology*, 6th Edn. Orient Longman, Chennai. 1994.
2. Dubey RC and Maheswari DK . *A text book of Microbiology*, Revised Multicolour edition, S. Chand Publishers, New Delhi. 2005.
3. Pelczar and Kreig. *Microbiology* 5th edition. Tata McGraw Hill, New Delhi. 2006.
4. Willey J.M., Sherwood L.M. and Woolverton C.J., *Prescott's Microbiology*, 10th Edition, McGraw - Hill Education, (ISBN: 978-981- 3151-26-0). 2017.
5. *Fields Virology* Vol 1 and 2. B.N. Fields, D.M. Knipe, P.M. Howley, R.M. Chanock, J.L. Melnick, T.P. Monath, B. Roizman, and S.E. Straus, eds.), 3rd Edition. Lippincott-Raven, Philadelphia, PA.
6. *Principles of Virology: Molecular Biology, Pathogenesis, and Control of Animal Viruses*. S. J. Flint, V. R. Racaniello, L. W. Enquist, V. R. Rancaniello, A. M. Skalka. Latest edition / Pub. Date: December 2003 Publisher: American Society Microbiology--- Chapters 3-13.

7. Luria SE, Darnel JE Jr, Baltimore D and Campbell A (1978) *General Virology*, 3rd Edn. John Wiley & Sons, New York
8. Roger Hull. *Mathews' Plant Virology*. (4th Edition). Academic press-A Harcourt Science and technology company, New York. 2002.
9. Waginer and M. Hewlett *Basic Virology*, Blackwell Publishers, 3rd edition.
10. Cann A. J. *Principles of molecular virology*, Elsevier academic press, 4th edition. 2005.