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|------------------------------|--------------------------|
| <b>Branch Name:</b>          | B.Sc. Biotechnology      |
| <b>Program Code:</b>         | SC101                    |
| <b>Course Name:</b>          | Fundamentals of Virology |
| <b>Course Code:</b>          | 2SC1010622               |
| <b>Pre-requisite Course:</b> |                          |

**Course Objectives:**

1. The course covers the details about the virus.
2. It includes general classification, cultivation, and enumeration of virus.
3. The bacteriophage, plant virus and animal virus must be studied.
4. The Course also provides the information about role of virus in cancer
5. It also discusses about the virus like particles prions and viroid.

**Teaching and Examination Scheme:**

| Teaching Scheme (Hours per week) |              |               |        | Evaluation Scheme (Marks) |                       |                       |                       |               |
|----------------------------------|--------------|---------------|--------|---------------------------|-----------------------|-----------------------|-----------------------|---------------|
| Lecture (L)                      | Tutorial (T) | Practical (P) | Credit | Theory (Marks)            |                       | Practical (Marks)     |                       | Total (Marks) |
|                                  |              |               |        | University Assessment     | Continuous Assessment | University Assessment | Continuous Assessment |               |
| 2                                | --           | --            | 2      | 35                        | 15                    | --                    | --                    | 50            |

**Subject Contents:**

| Sr. No | Topic                                                                                                                                                                                                                                                                                                                                                                                        | Total Hours | Weightage (%) |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------|
| 1      | <b>Nature and Properties of Viruses</b><br>Introduction to virus,, Basic Principles of Viral taxonomy<br>Structure of virus: Size, General Properties, Viral envelope and enzymes Viral Genome<br>Viral Multiplication<br><b>Cultivation, purification and assay of viruses</b><br>Bacteriophage :Classification, one step multiplication curve, lytic and lysogenic phages (lambda phage) . | 15          | 50%           |
| 2      | <b>Virus of Eukaryotes</b><br><b>Animal Virus:</b> Classification , Reproduction, Cytocidal effects and cell damage<br><b>Plant Virus:</b> Morphology,Taxonomy. Reproduction, Transmission<br><b>Virus of Fungi and Algae and Virus of Insects</b><br><b>Virus and Cancer</b><br><b>Viriods and Prions</b>                                                                                   | 15          | 50%           |

**Text Books:**

Microbiology by Lansing Prescott 5<sup>th</sup> Edition  
 Prescott's Principles of Microbiology published by McGraw-Hill.  
 Willey JM, Sherwood LM, and Woolverton CJ.(2013). Prescott's Microbiology.9th edition. McGraw Hill Higher Education.

**Reference Books:**

1. Dimmock, NJ, Easton, AL, Leppard, KN (2007). Introduction to Modern Virology. 6th edition, Blackwell Publishing Ltd.
2. Carter J and Saunders V (2007). Virology: Principles and Applications. John Wiley and Sons.
3. Flint SJ, Enquist, LW, Krug, RM, Racaniello, VR, Skalka, AM (2004). Principles of Virology, Molecular biology, Pathogenesis and Control. 2nd edition. ASM press Washington DC.

4. Levy JA, Conrat HF, Owens RA. (2000). Virology. 3rd edition. Prentice Hall publication, New Jersey.
5. Wagner EK, Hewlett MJ. (2004). Basic Virology. 2nd edition. Blackwell Publishing.
6. Mathews. (2004). Plant Virology. Hull R. Academic Press, New York.
7. Nayudu MV. (2008). Plant Viruses. Tata McGraw Hill, India.
8. Bos L. (1999) Plant viruses-A text book of plant virology by. Backhuys Publishers.
9. Versteeg J. (1985). A Color Atlas of Virology. Wolfe Medical Publication.
10. Medical Virology 10 Th Edition by Morag C and Tim bury M C 1994. ChurchillLivingstone, London.
11. Introduction to Modern Virology 4th Edition by Dimmock N J, Primrose S. B. 1994. Blackwell Scientific Publications. Oxford.
12. Virology 3 rd Edition by Conrat H.F., Kimball P.C. and Levy J.A. 1994. Prentice Hall, Englewood Cliff, New Jersey.
13. Text Book on Principles of Bacteriology, Virology and Immunology Topley and Wilsons 1995.
14. Molecular Biology, Pathogenesis and Control by S.J. Flint and others. ASM Press, Washington, D.C.
15. Applied Virology. 1984. Edited by EdonardKurstak. Academic Press Inc.
16. Introduction to Modern Virology by Dimmock.
17. Prion diseases by Gaschup, M.H.
18. Clinical virology Manual by Steven, S., Adinka, R.L., Young, S.A.
19. Principles of Virology. 2000 by Edward Arnold.

**Course Learning Outcomes (CLO): On completion of this course, the students will be able to:**

| <b>CLO</b> | <b>Description</b>                                                                                                                               | <b>Bloom's Taxonomy Level</b> |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CLO1       | Learn virus classification and its structure                                                                                                     | 1 Remember                    |
| CLO2       | Basically, understand the factors responsible for decision making and practice efficient decision making ability                                 | 2 Understand<br>3 Apply       |
| CLO3       | Apply and explore the area of cultivation and enumeration of virus                                                                               | 3 Apply                       |
| CLO4       | Analyze various types and of virus                                                                                                               | 4 Analyze                     |
| CLO5       | Think critically about                                                                                                                           | 5 Evaluate                    |
| CLO6       | The Student would understand the process and mechanism of cancer and various disease caused by virus so that a treatment process can be designed | 2 Understand<br>6 Create      |

### Mapping of CLOs with Pos & PSOs

| <b>Course Learning Outcomes</b> | <b>Program Outcomes (POs)</b> |            |            |            |            |            |            |            |            |             |             |             | <b>Program Specific Outcomes (PSOs)</b> |             |             |
|---------------------------------|-------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-----------------------------------------|-------------|-------------|
|                                 | <b>PO1</b>                    | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> | <b>PO6</b> | <b>PO7</b> | <b>PO8</b> | <b>PO9</b> | <b>PO10</b> | <b>PO11</b> | <b>PO12</b> | <b>PSO1</b>                             | <b>PSO2</b> | <b>PSO3</b> |
| <b>CLO1</b>                     | M                             | H          |            | H          |            | M          | H          |            | H          | M           | L           | H           | L                                       |             |             |
| <b>CLO2</b>                     | H                             | M          |            | M          | M          | H          | H          | H          | M          |             | M           |             |                                         | M           | L           |
| <b>CLO3</b>                     |                               | L          | L          |            | H          |            | H          | H          | H          | L           | M           | H           | M                                       | M           | M           |
| <b>CLO4</b>                     | M                             | H          | L          | M          |            | M          |            | L          | H          |             |             | H           | M                                       |             |             |
| <b>CLO5</b>                     | M                             |            | M          | L          | M          | H          | H          | M          |            | H           | M           | M           |                                         | M           | L           |
| <b>CLO6</b>                     | L                             | M          |            |            | L          |            | H          | M          | M          |             |             | M           | M                                       | M           | M           |

**H:High, M:Medium, L:Low**