

# B. Sc. Botany I Semester

**Paper-I : Viruses, Bacteria, Cyanobacteria, Algae, Fungi and Lichens**

**Code: BOT-101**

**Univ Code:**

**Contact Hours: 50 Hours**

**Workload: 4 hours per week**

**Credit Points:**

**Evaluation: Continuous Internal Assessment - 30 marks**

**Semester End Examination- 70 marks**

**Theory:**

**Unit 1:**

Aim and Scope of Microbiology

**1 Hr**

**Unit 2: VIRUSES :-**

**4 Hrs**

History and Discovery – Characteristics feature of viruses , Structure of Bacteriophage and T. M. V, Diseases caused by T. M. V and Papaya Leaf Curl Virus (P. L.C. V)

**Unit 3: BACTERIA: -**

**5 Hrs**

Introduction, Classification, flagellation, Ultra structure, Nutrition, Chemistry of gram +ve and gram –ve Bacteria. Brief account of plasmids Reproduction in Bacteria – Cell division, Conjugation, transduction and transformation. Economic importance of Bacteria (Useful and harmful effects).

Bacteria diseases – Citrus canker, Sugarcane red stripe.

**Unit 4: CYANOBACTERIA:-**

**3 Hrs**

A general account of occurrence, ultra structure of cell. Photosynthesis and reproduction. Economic importance in N<sub>2</sub> fixation. Type study of Scytonema, Gloeotrichia and Oscillatoria

**Unit 5: ALGAE: -**

**10 Hrs**

A general account (Characteristics). Thallus organization, Structure, Reproduction, Life cycle pattern and classification (Fritsch). Study of structure, reproduction and life cycle of *Volvox*, *Oedogonium* and *Chara*. Diatoms only Pennate type (reproduction - cell-division and Auxospore formation). *Ectocarpus* and

*Batrachospermum*. (Developmental aspects are not required).

**Unit 6: FUNGI: -**

**5 Hrs**

General Characters, Classification based on Alexopolous. Structure, Reproduction and life cycle, disease symptoms and controlling methods of following :

Plants

*Albugo*, *Rhizopus*, *Pencillium*, *Puccinia* and *Cercospora*

**Unit 7: LICHENS:-****2 Hr**

Occurrence and classification. External and internal structures of Crustose, Foliose and Frustricose Lichens – Economic importance as spices, medicine, cosmetics and pollution indicators.

**Unit 8: PLANT PATHOLOGY:-****2 Hrs**

Symptoms, etiology, casual organism and control of the following diseases.

(1) Red rot of Sugarcane (2) Powdery mildew of Crucifers (3) Smut disease of Jawar

**Unit 9: BIO-PROSPECTING****08 Hrs**

1. *Nostoc*, *Anabaena* and *Rhizobium* as fertilizer.
2. Use of *Trichoderma* as pesticides
3. *Spirulina* as food

**Reference Books:-**

1. Agrios G.N, 1988. Plant Pathology, Academic Press. San Diego, London.
2. Alexopoulos and Mims C. N. 1983. Introductory Mycology. Willey Estern, New-York
3. Rangaswamy G. 1988. Diseases of crop plants in India. Prentice Hall of India.
4. Gangulee & Kar 1993. College Botany Vol.- II, New Central book agency, Kolkatta.
5. Hans G. Schlegel (1993) General Microbiology Volume-I, Cambridge Press, Cambridge.
6. F Whitcomb and J.G Turil (1978) the Mycoplasmas-III Plant and Mycoplasmas.
7. C.L. Mandahar (1978) Introduction to plant viruses.
8. Mathews (1981) Plant Viruses.
9. K.M.Smith (1977) Plant Viruses.
10. Smith, G.M. 1971. Cyptogamic botany, Vol. 1 Alage & Fungi, Tata McGraw Hill Publishing Co., New Delhi.
11. Sharma, O.P. 1992. Text book of Thallophytes. Tata McGraw Hill Publishing Co., New Delhi.
12. Sharma, P.D. The Fungi. Rastogi and Co., Meerut.
13. Dube, H.C. 1990. An Introduction to Fungi. Vikas Publishing House Pvt. Ltd. New Delhi.
14. Clifton, A. 1958. Introduction to the Bacteria. Tata McGraw Hill Publishing Co., New Delhi.
15. Aneja, K.R. 1993. Experiments in Microbiology, Pathology and Tissue Culture. Vishwa Prakashan, New Delhi.
16. Basu, A.N. 1993. Essentials of plant viruses, vectors and plant diseases. New Age International, New Delhi.
17. Chopra, G.L. A text book of algae. Rastogi and Co., Meerut.
18. Fritze, R.E. 1977. Structure and reproduction of Algae. Cambridge University Press.
19. Rangaswamy, G. 1988. Diseases of crop plants of India. Prentice Hall of India, New Delhi.
20. Sundarajan, S. 1977. College Botany, Vol. 1. S. Chand & Co., Ltd., New Delhi.
21. Alexopoulos, 1992. An introduction to Mycology. New Age International, New Delhi.
22. Vashista, B.R. 1978. Fungi. S. Chand & Co., Ltd., New Delhi.

B. Sc. Botany First Semester, **Practical – I**

**MODEL QUESTION PAPER:**

**Paper-I : Viruses, Bacteria, Cyanobacteria, Algae Fungi and Lichens**

**Time:** 03 Hrs

**Max. Marks:** 40

- |   |    |
|---|----|
| 1. Stain the given material 'A' by the staining using (Safranin) / Crystal Violet (in curds). Write the procedure and identify with reasons | 04 |
| 2. Identify the specimens B, C D. & E. Sketch and label giving reasons  | 12 |
| B                 -       Cyanobacteria   |    |
| C                 -       Algae   |    |
| D                 -       Fungi   |    |
| E                 -       Lichens   |    |
| 3. Identify the specimens F. and G draw labeled diagram with reasons.   | 06 |
| F                 -       Viral / Bacterial disease   |    |
| G                 -       Fungal disease  |    |
| 4. Identify the slides H , I , J& K giving reasons  | 08 |
| H                 -       Algae   |    |
| I                 -       Algae   |    |
| J                 -       Fungi   |    |
| K                 -       Fungi   |    |
| 5. Questions on Bio prospecting   | 05 |
| L                 -       Bio fertilizers   |    |
| M                 -       Bio Pesticides  |    |
| 6. Record and Submission  | 05 |

**Total 40**

**Scheme of Evaluation for Botany Practical-I**

**B. Sc. I Semester**

**Practical – I: Viruses, Bacteria, Cyanobacteria, Algae, Fungi & Lichens**

- |  |                 |
|--|-----------------|
| 1. Gram Staining of Material A         | 04              |
| Staining procedure                     | -     02        |
| Identification                         | -     02        |
| 2. Identify the Specimens B, C, D & E  | 12              |
| Identification                         | -     01        |
| Sketch & Label                         | -     01        |
| Reasons                                | -     01        |
| 3. Identify the Specimens F and G      | 06              |
| Casual organism of disease             | -     01        |
| Symptoms                               | -     01        |
| Control measures                       | -     01        |
| 4. Identify the slides H , I , J and K | 08              |
| Identification                         | -     01        |
| Reasons                                | -     01        |
| 5. Questions on Bio Prospecting L & M  | 05              |
| L                                      | -     2 ½ Marks |
| M                                      | -     2 ½ Marks |
| 6. Record and submission               | 05              |

**Total = 40**

Note: Every student must submit at least 5 specimens from the forms studied.