CLUSTER UNIVERSITY SRINAGAR

SYLLABUS (FYUP UNDER NEP 2020)

Semester 1st (Major Course)

Course Title (CT1): Microbes & Algae

Course Code: UGBOT24J101
Credits: 4 (Theory: 3, Practical: 1)
Contact Hours: 75 (Theory: 45, Practical: 30)

Max. Marks: 100
Theory External: 60 (Min. Marks: 24)
Theory Internal (Continuous Assessment): 15 (Min. Marks: 06)
Practical Experimental Based: 15 (Min. Marks: 06)
Practical Experimental (Continuous Assessment): 10 (Min. Marks:04)

Course Objectives

1. To impart understanding about the diversity, structure and reproduction of viruses, bacteria and algae.

2. To help students in understanding the economic importance of bacteria and Algae

Course Learning outcome

1. Understand the basic concepts of microbes and algae.
2. Understand economic importance of Viruses, bacteria , and algae
3. Understand the difference in morphology and reproduction of different genera in algae.

Unit I

Viruses and Bacteria: Discovery, general characteristics and structure of viruses and bacteria . Lytic and Lysogenic cycle in viruses, reproduction in bacteria (vegetative , asexual and recombination). General account on plant viruses (TMV), bacteriophages , viroids , prions, mycoplasma and archaea.

Unit II

Algae: General Characteristics , Classification(Round, 1965) : range of thallus organization; morphology and life cycle of *Nostoc, Volvox, Vaucheria* and *Betrachospermum.*

Unit III

Economic importance ;

Economic importance of viruses, bacteria . algae as source of food , fodder, fertilizers, medicine , biofuels , phycocolloids (agar agar, algenic acid and carragheenin) : algae as indicator of pollution ; algal blooms – causal factors and control.

Practicals

1. Electron micrographs / Models of viruses.
2. Study of the structure and types of bacteria.
3. Gram staining in Bacteria
4. Preparation of temporary mount and study of the life cycle of *Nostoc*.
5. Study of diversity in thallus forms of algae (*Volvox, Vaucheria* and *Betrachospermum).*
6. Field trip for local algal collection.

SUGGESTED READINGS

1. • Tortora, G.J., Funke, B.R., Case, C. L. (2010). Microbiology: An Introduction, Pearson Benjamin Cummings, U.S.A. 10th edition.

2. • Fritsch, F.E. 1979. The structure and reproduction of algae. Vols. I and II. Cambridge University Press.
3. • Prescott, G.W. 1984. The Algae: A Review. Otto Koeltz Science Publishers, Germany.
4. • Bold and Wynne. 1985. Introduction to the Algae. Prentice Hall, USA.
5. • Singh, V., Pande, C. and Jain, D. K. 2010. Diversity of Microbes and Cryptogams. Rastogi Publications
6. • Vashishta, B. R., Sinha, A.K. and Singh, V. P. 2008. Botany for Degree Students- Algae. S. Chand and Company Pvt. Ltd., New Delhi.
7. • Kumar, H. D. (1999). Introductory Phycology. Affiliated East-West Press Pvt. Ltd. Delhi.2nd edition.
8. • Raven, P. H., Johnson, G. B., Losos, J.B., Singer, S. R., (2005). Biology. Tata McGraw Hill, Delhi, India.