BSBOT - SN101
[w.e.f. 2020-21, Admitted Batch]

CBCS / Semester System (w.e.f. 2020-'21 Admitted Batch)

I Semester /Botany Core Course - 1

Fundamentals of Microbes and Non-vascular Plants

(Viruses, Bacteria, Fungi, Lichens, Algae and Bryophytes) (Total hours of teaching – 60 @ 04 Hrs./Week)

Theory:

Learning Outcomes:

On successful completion of this course, the students will be able to:

- Explain origin of life on the earth.
- Illustrate diversity among the viruses and prokaryotic organisms and can categorize them.
- Classify fungi, lichens, algaeand bryophytes based on theirstructure, reproduction and life cycles.
- Analyze and ascertain the plant disease symptoms due to viruses, bacteria and fungi.
- Recall and explain theevolutionary trends among amphibians of plant kingdom for their shift to land habitat.
- Evaluate the ecological and economic value of microbes, thallophytes and bryophytes.

Unit – 1:Origin of life and Viruses **12Hrs.**

1. Origin of life, concept of primary Abiogenesis;Miller and Urey experiment.Five kingdom classification of R.H. Whittaker
2. Discovery of microorganisms,Pasteur experiments, germ theory of diseases.
3. Shape and symmetry of viruses; structure of TMV and Gemini virus; multiplicationof TMV; A brief account of Prions and Viroids.
4. A general account on symptoms of plant diseases caused by Viruses.Transmission of plant viruses and their control.
5. Significance of viruses in vaccine production,bio-pesticides and as cloning vectors.

Unit – 2:Special groups of Bacteria and Eubacteria **12Hrs.**

1. Brief account of Archaebacteria, Actinomycetes and Cyanobacteria.

2. Cell structure and nutrition of Eubacteria.
3. Reproduction- Asexual (Binary fission and endospores) and bacterial recombination (Conjugation, Transformation,Transduction).
4. Economic importance of Bacteria with reference to their role in Agriculture and industry (fermentation and medicine).
5. A general account on symptoms of plant diseases caused by Bacteria; Citrus canker.

Unit – 3: Fungi & Lichens **12 Hrs.**

1. General characteristics of fungi and Ainsworth classification (upto classes).
2. Structure, reproductionand life history of(a)*Rhizopus*(Zygomycota)and (b)*Puccinia* (Basidiomycota).
3. Economic uses of fungi in food industry, pharmacy and agriculture.
4. A general account on symptoms of plant diseases caused by Fungi; Blast of Rice.
5. Lichens- structure and reproduction; ecological and economic importance.

Unit – 4: Algae **12 Hrs.**

1. General characteristics of Algae (pigments, flagella and reserve food material);Fritsch classification (upto classes).
2. Thallus organization and life cycles in Algae.
3. Occurrence, structure, reproduction and life cycle of *(a)Spirogyra* (Chlorophyceae) and (b) *Polysiphonia* (Rhodophyceae).
4. Economic importance of Algae.

Unit – 5:Bryophytes **12 Hrs.**

1. General characteristics of Bryophytes classification upto classes.
2. Occurrence, morphology, anatomy, reproduction (developmental details are not needed) and life cycle of (a) *Marchantia* (Hepaticopsida) and (b) *Funaria*(Bryopsida).
3. General account on evolution of sporophytes in Bryophyta.

Text books:

- Botany – I (Vrukshasastram-I) : Telugu Akademi, Hyderabad
- Pandey, B.P. (2013) *College Botany, Volume-I,* S. Chand Publishing, New Delhi
- Hait,G., K.Bhattacharya&A.K.Ghosh (2011) *A Text Book of Botany, Volume-I,* New Central Book Agency Pvt. Ltd., Kolkata

- Bhattacharjee, R.N., (2017) *Introduction to Microbiology and Microbial Diversity,* Kalyani Publishers, New Delhi.

Books for Reference:

- Dubey, R.C. &D.K.Maheswari (2013) *A Text Book of Microbiology,*S.Chand& Company Ltd., New Delhi
- Pelczar Jr., M.J., E.C.N. Chan &N.R.Krieg (2001)*Microbiology*, Tata McGrawHill Co, New Delhi
- Presscott, L. Harley, J. and Klein, D. (2005)*Microbiology, 6th edition*, Tata McGraw –Hill Co. New Delhi.
- Alexopoulos, C.J., C.W.Mims&M.Blackwell (2007) *Introductory Mycology,*Wiley& Sons, Inc., New York
- Mehrotra, R.S. & K. R. Aneja (1990)*An Introduction to Mycology*. New Age International Publishers, New Delhi
- Kevin Kavanagh (2005) *Fungi ; Biology and Applications* John Wiley & Sons, Ltd.,West Sussex, England
- John Webster & R. W. S. Weber (2007) *Introduction to Fungi,*Cambridge University Press, New York
- Fritsch, F.E. (1945)*The Structure & Reproduction of Algae (Vol. I & Vol. II)*Cambridge UniversityPress Cambridge, U.K..
- Bold, H.C. & M. J. Wynne (1984)*Introduction to the Algae,* Prentice-Hall Inc., New Jersey
- Robert Edward Lee (2008)*Phycology.* Cambridge University Press, New York
- Van Den Hoek, C., D.G.Mann&H.M.Jahns (1996)*Algae : An Introduction to Phycology*. Cambridge University Press, New York
- Shaw, A.J.&B.Goffinet (2000)*Bryophyte Biology.*Cambridge University Press, New York.