

**Biology & Diversity of Viruses, Bacteria and Fungi**

**BOT101**

**UNIT-I**

Viruses: characteristics and ultrastructure of virions, isolation and purification viruses; chemical nature, replication, transmission of viruses; economic importance.

**UNIT-II**

Archaea and Eubacteria: General account; ultrastructure, nutrition and reproduction; biology and economic importance; cyanobacteria — salient features and biological importance.

**UNIT-III**

Classification of bacteria, Actinomycetes, Mycoplasma, Rickettsiae, Chlamydia and their significance.

**UNIT-IV**

Mycology: classification and general characters of fungi; substrate relationships of fungi; cell ultrastructure; unicellular and multicellular organization; cell wall composition; nutrition (saprobic, biotrophic, symbiotic); reproduction (vegetative asexual, sexual), heterothallic; parasexuality; recent trends in classification.

**UNIT-V**

Phylogeny of Fungi: Phylogeny of fungi; general account of Mastigomycota Zygomycotina, Ascomycotina, Basidiomycotina, Deuteromycotina; fungi industry, medicine and as food; fungal diseases in plants and human Mycorrhiza; fungi as biocontrol agents.

**Suggested readings:**

1. Madigan, M.T., Martinko, J.M., Dunlap, P.V., Clark, D.P., 2011. Brock Biology of Microorganisms. 13<sup>th</sup> edition, Pearson Education Inc.
2. Stanier, R.Y., Ingraham, J.L., Wheelis, M.L., Painter, P.R., 1987. General Microbiology. Fifth edition. MacMillan.
3. Atlas, R.M. 1995. Principles of Microbiology. Moby.
4. Lim, D.V. 2003. Microbiology. Kendall/Hunt.
5. Boundless. 2013. Microbiology. Boundless Learning, Incorporated.

**Laboratory Practical**

1-Morphological study of representative members of Fungi

-2 -Symptomatology of some diseased specimens

-3-Identification of Fungal cultures

**Biology & Diversity of Algae, Bryophytes and Pteridophytes**

**BOT102**

**UNIT-I**

Algae in diversified habitats; thallus organization; cell ultrastructure; reproduction criteria for classification of algae, pigments, reserve foods, flagella classification.

**UNIT-II**

Salient features of Protochlorophyta, charophyta, chlorophyta, xanthophyta, bacillariophyta, phaeophyta and rhodophyta; algal blooms; algal biofertilizers algae as food, feed and industrial uses.

**UNIT-III**

Morphology, structure, reproduction and life history of bryophyta; distribution, classification, general accounts of marchantiales, jungermeniales, anthocerotales, sphagnales, funariales and polytrichales; ecological and economic importance.

**UNIT-IV**

Morphology, anatomy, reproduction and life history of pteridophyta; classification, evolution of stele, heterospory and origin of seed habits.

**UNIT-V**

Introduction to psilopsida, sphenopsida and pteropsida

**Suggested Readings:**

Smith G. M. Cryptogamic Botany Vol 1(2nd edition)— TataMcGraw-Hill Publishing Company Ltd. Bombay -New Delhi.

Laboratory Practical

- 1-Morphological Study of representative of Algae-I
- 2-Morphological Study of representative of Bryophytes
- 3--Morphological Study of representative of pteridophytes

**Biology & Diversity of Gymnosperms**

**BOT103**

**UNIT-I**

Introduction: Gymnosperms, the vesseless and fruitless seed plants; evolution of gymnosperms; complexity of female gametophytes.

**UNIT-II**

Classification of gymnosperms and their distribution in India. Economil importance of gymnosperms

**UNIT-III**

General account of pteridospermales, cycadeoidales and cordaitales.

**UNIT-IV**

Structure, reproduction and interrelationships of cycadales, ginkgoales and coniferales.

**UNIT-V**

Structure, reproduction and interrelationships of ephedrales, welwitschiales and gnetales.

**Suggested Readings:**

- Bhatnagar, S.P. and Moitra, A; 1996: Gymnosperms. New Age International Pvt, Ltd., New Delhi.
- Singh H.; 1978: Embryology of Gymnosperms, Encyclopedia of Plant Anatomy ) Gebruder Bortraeger, Berlin.
- Spome K R; 1991: The Morphology of Gymnosperms; Hutchinson Univ. Library; London.

**Laboratory Practical**

1-Study of Morphology and other features of important fossils of India  
(Specimen & slides)

-Comparative study of the anatomy of vegetative and reproductive parts of gymnosperm

**Plant Ecology**

**Paper Code : BOT104**

**UNIT-I**

Population Ecology: Ecology & ecosystem: Definitions, Organization and components, Population & Environment; Population ecology, density & distribution, Natality, Mortality, Survivorship curves, Age structure & pyramids, Fecundity schedules, Life tables; Population growth -- exponential and logistic curves; Intra specific competition and self regulation; r and k-strategists.

**UNIT-II**

Community organization: Concepts of community and continuum; Analysis of community analytical and synthetic characters, Community coefficients and indices of diversity, interspecific association negative and positive associations; Concept of ecological niche; Concepts of biodiversity; evolution and differentiation of species -- allopatric & sympatric speciation; ecads and ecotypes.

**UNIT-III**

Ecosystem development and stability: Temporal changes cyclic and non cyclic; Succession processes & types; Mechanism of succession facilitation, Tolerance and inhibition models; Concept of climax persistence resilience and resistance; Ecological perturbation natural and anthropogenic, Ecosystem restoration.

**UNIT-IV**

Fate of energy in ecosystems: Trophic organization and structure, Food chains & webs; energy flow pathways, Ecological efficiencies consumption, assimilation and production trophic; Primary production methods of measurement, Global patterns, Limiting factors.

**UNIT-V**

Fate of matter in ecosystems: Recycling pathways; Relationship between energy flow and recycling pathways; Nutrient exchange and cycling; Global biogeochemical cycles of C, N, P and S; Physical, chemical and Biological characteristics of soil.

**Suggested reading:**

1. Odum, E. P. and Barret G.W. 2005. Fundamentals of Ecology. Cengage publication
2. Odum, E.P., 1983. Basic Ecology., Saunders College Publishing
3. Singh, J.S., Singh S.P. and Gupta S.R. 2006. Ecology Environment and Resource Conservation. Anamaya Publishers

**Laboratory Practical**

To get acquainted with terminology related to various parts of the plants

To describe a fresh/preserved plant specimen of local importance