

COMPLEMENTARY COURSES FOR MODEL I B Sc ZOOLOGY

SEMESTER I

Complementary course 1

Code: BO1CMT01

CRYPTOGAMS, GYMNOSPERMS AND PLANT PATHOLOGY

(Theory 36 hrs; Practical 36 hrs; Credits 2 + 1)

Objectives:

- Acquire fundamental knowledge in plant science and to make the student to understand that Botany is an integral part of the human life and developments.
- Foster and encourage an attitude of curiosity, appreciation and enquiry of various life forms of plants.
- Understand the identifying characters of the different types included in the syllabus.
- Understand the diversity of plants with respect to Algae, Fungi, Lichens, Bryophytes, Pteridophytes and Gymnosperms.

CRYPTOGAMS (27 hrs)

Module 1: Algae (13 hrs)

General characters of algae and their classification up to classes (F E Fritsch); range of thallus variation in Algae. Reproduction and life history of the following groups with reference to the types mentioned: Cyanophyceae - *Nostoc*; Chlorophyceae - *Oedogonium* (*Volvox*, *Spirogyra*, *Cladophora* - vegetative features only); Phaeophyceae – *Sargassum*; Rhodophyceae – *Polysiphonia*.

Economic importance of Algae: food, industry, medicine, biofertilizers; algal bloom.

Module 2: Fungi and lichens (9 hrs)

General characters and outline on the classification of fungi by Ainsworth. General characters, thallus structure, reproduction and life history of the following groups with reference to the types mentioned: Zygomycotina – Rhizopus; Ascomycetes – *Xylaria*; Basidiomycetes – *Puccinia*.

Economic importance of Fungi: as food, industry, decomposition of organic matter. Fungal toxins and human health.

Lichens: Classification based on thallus morphology. Usnea - morphology and anatomy of vegetative and reproductive structure. Economic importance of lichen: food, industry, medicine.

Module 3: Bryophytes (2 hrs)

General characters of Bryophytes. Morphology, anatomy, reproduction and life cycle of *Riccia*.

Module 4: Pteridophytes (3 hrs)

General characters of Pteridophytes. Morphology, anatomy (stem), reproduction and life cycle of *Selaginella*.

Module 5: GYMNOSPERMS (4 hrs)

General characters of Gymnosperms. Morphology, anatomy (leaf let), reproduction and life cycle of *Cycas*.

PLANT PATHOLOGY (5 hrs)

Module 6: Plant diseases (5 hrs)

Classification of plant diseases on the basis causative organism and symptoms. Study the following diseases with special emphasis on causative organism, symptoms and control measures:

(i) Nut fall of Arecanut (ii) Bacterial blight of Paddy (iii) Leaf mosaic of Tapioca.

PRACTICAL (36 hrs)

1. Micropreparation and identification preparation of the following:
 - (i) Algae: vegetative structure of *Nostoc*, *Volvox*, *Spirogyra*, *Oedogonium*, *Cladophora*, *Polysiphonia*. Vegetative and reproductive structure of *Sargassum*.
 - (ii) Fungi: vegetative and reproductive structure of *Rhizopus*, *Xylaria*, *Puccinia*.
 - (iii) Lichen: morphology of *Usnea* thallus and Apothecium.
 - (iv) Bryophytes: *Riccia* thallus anatomy.
 - (v) Pteridophytes: *Selaginella* - anatomy of stem and morphology of strobilus.
 - (vi) Gymnosperms: *Cycas* - Anatomy of leaflet, morphological features of megasporophyll, microsporophyll and ovule.
2. Identify plant diseases mentioned in the syllabus.

REFERENCES

1. Ahamdijan, Vernon, Mason H E, 1973. The Lichens. Academic press, New York.
2. Alexopoulou C J, Mims C W, 1983. Introductory Mycology. Wiley Eastern, New York.
3. Bhatia K N, 1975. A treatise on Algae. S Chand and Co.
4. Bilgrami K S, Dube H C, 1976. Text Book of Modern Plant pathology. Vikas Publishing House Pvt. Ltd. New Delhi.
5. Chaube H S, Ramji S, 2001. Introductory Plant Pathology. International Book Distributing Co. Lucknow.
6. Chopra R N, Kumra P K, 1988. Biology of Bryophytes. Wiley Eastern Ltd. New Delhi.
7. Fritsch F E, 1945. Structure and Reproduction of Algae Vol. I & II. Cambridge University Press.
8. Gangulee H C, Kar A K, 1993. College Botany Vol. II. New Central Book Agency, Calcutta.
9. Kanika Sharma, 2009. Manual of Microbiology. Ane Books Pvt. Ltd.
10. Mamatha Rao, 2009. Microbes and Non-flowering plants: Impact and applications. Ane Books Pvt. Ltd.
11. Pandey S N, Trivedi P S, 1994. A Text book of College Botany Vol. I.
12. Pandey S N, Trivedi P S, 1998. A Text book of College Botany Vol. II.
13. Pandey B P, 2007. College Botany Vol. I. S.Chand and Company.
14. Pandey B P, 2007. College Botany Vol. II. S Chand and Company.
15. Sharma P D, 2003. Microbiology, Plant Pathology and Biotechnology. Rasthogy Publications.
16. Vasishta B R. Bryophyta. S Chand and Co. New Delhi.

SEMESTER II

Complementary course 2**Code: BO2CMT02****PLANT PHYSIOLOGY****(Theory 36 hrs; Practical 36 hrs; Credits 2 + 1)****Objectives:**

- Make the students realize the importance of all physiological processes which take place in plants.
- Understand the mechanism of various physiological processes related to plant life.

Module 1: Water relations (11 hrs)

Plant water relations: Physical aspects of water absorption - Diffusion, DP, DPD. Imbibition. Osmosis - OP, Exosmosis, Endosmosis, Plasmolysis. Water potential and its components. Mechanism of water