

Regular Course (Botany)

Curriculum Structures for UG syllabus for B.Sc. Botany

No. of papers =12+12=24, Total Credits= 120

Total Marks=2100

SEM-I						
Paper Code	Course	Credit	Credit Distribution (L+T+P)	End Sem Marks	Internal Marks	Total Marks
BOT-101R	DSC-1A: Biodiversity (Microbes, Algae, Fungi and Archegoniate)	6	4+0+2	60(Theo)+20(Pract)	20	100
Paper-102R	DSC-2A	6	4+0+2	60(Theo)+20(Pract)	20	100
Paper-103R	DSC-3A	6	4+0+2	60(Theo)+20(Pract)	20	100
COMM-104HR	AEC: AECC-1: English/Hind/MIL (Communication)	2	2+0+0	50	-	50
Total		20	20	290	60	350

Details of Courses

Core Courses –Botany

1. Biodiversity (Microbes, Algae, Fungi and Archegoniate)
2. Plant Ecology and Taxonomy
3. Plant Anatomy and Embryology
4. Plant Physiology and Metabolism

Discipline Specific Electives-Botany (Two)

DSE 1: Analytical Techniques in Plant Sciences

DSE 2: Bioinformatics

BOTANY

Ability Enhancement Compulsory Courses

3. Environmental Science
4. English/MIL Communication

Skill Enhancement Courses (Four)

Botany

SEC 1: Biofertilizers

SEC 2: Nursery and Gardening

SEC 3: Medicinal Botany

SEC 4: Mushroom Culture Technology

BOTANY

Semester-I

DSC-1A: Biodiversity (Microbes, Algae, Fungi and Archegoniate) (Credits: Theory-4, Practicals-2)

THEORY

Lectures: 40

Unit 1: Microbes

(6 Lectures)

Viruses – Discovery, general structure, replication (general account); Economic importance; Bacteria– Discovery, General characteristics and cell structure; Reproduction – vegetative, asexual and recombination (conjugation, transformation and transduction); Economic importance.

Unit 2: Algae

(9 Lectures)

General characteristics; Ecology and distribution; Range of thallus organization and reproduction; Classification of algae; Morphology and life-cycles of the following: *Nostoc*, *Chlamydomonas*, *Polysiphonia*. Economic importance of algae

Unit 3: Fungi

(9 Lectures)

Introduction- General characteristics, ecology and significance, range of thallus organization, cell wall composition, nutrition, reproduction and classification; life cycle of *Rhizopus* (Zygomycota) *Penicillium* (Ascomycota), *Puccinia*, *Agaricus* (Basidiomycota); Symbiotic Associations- Lichens: General account, reproduction and significance; Mycorrhiza: ectomycorrhiza and endomycorrhiza and their significance.

Unit 4: Introduction to Archegoniate

(1 Lectures)

Unifying features of archegoniates, Transition to land habit, Alternation of generations.

Unit 5: Bryophytes

(6 Lectures)

General characteristics, Classification (up to family), morphology, anatomy and reproduction of *Marchantia* and *Funaria*. Ecology and economic importance of bryophytes with special mention of *Sphagnum*.

Unit 6: Pteridophytes

(5 Lectures)

General characteristics, classification, Early land plants (*Rhynia*). Classification (up to family), morphology, anatomy and reproduction of *Selaginella*, *Equisetum*. Heterospory and seed habit. Ecological and economical importance of Pteridophytes.

Unit 7: Gymnosperms

(4 Lectures)

General characteristics. Classification (up to family), morphology, anatomy and reproduction of *Cycas* and *Pinus*. Ecological and economical importance.

BOTANY

Practical

1. EMs/Models of viruses – T-Phage and TMV.
2. Types of Bacteria from temporary/permanent slides/photographs; EM bacterium.
3. Gram staining
4. Study of vegetative and reproductive structures of *Nostoc*, *Chlamydomonas* (electron micrographs), *Polysiphonia* through temporary preparations and permanent slides. (* *Fucus* - Specimen and permanent slides)
5. *Rhizopus* and *Penicillium*: Asexual stage from temporary mounts and sexual structures through permanent slides.
6. *Puccinia*: Herbarium specimens and permanent slides
7. *Agaricus*: Specimens of button stage and full grown mushroom; Sectioning of gills of *Agaricus*.
8. Lichens: Study of growth forms of lichens (crustose, foliose and fruticose).
9. ***Marchantia***- morphology of thallus, w.m. rhizoids and scales, v.s. thallus through gemma cup, w.m. gemmae (all temporary slides), v.s. antheridiophore, archegoniophore, l.s. sporophyte (all permanent slides).
10. ***Selaginella***- morphology, w.m. leaf with ligule, t.s. stem, w.m. strobilus, w.m. microsporophyll and megasporophyll (temporary slides), l.s. strobilus (permanent slide).
19. ***Cycas***- morphology (coralloid roots, bulbil, leaf), t.s. coralloid root, t.s. rachis, v.s. leaflet, v.s. microsporophyll, w.m. spores (temporary slides), l.s. ovule, t.s. root (permanent slide).
20. ***Pinus***- morphology (long and dwarf shoots, w.m. dwarf shoot, male and female), w.m. dwarf shoot, t.s. needle, t.s. stem, l.s./t.s. male cone, w.m. microsporophyll, w.m. microspores (temporary slides), l.s. female cone, t.l.s. & r.l.s. stem (permanent slide).

Suggested Readings

1. Kumar, H.D. (1999). Introductory Phycology. Affiliated East-West. Press Pvt.Ltd. Delhi. 2nd edition.
2. Tortora, G.J., Funke, B.R., Case, C.L. (2010). Microbiology: An Introduction, Pearson Benjamin Cummings, U.S.A. 10th edition.
3. Sethi, I.K. and Walia, S.K. (2011). Text book of Fungi & Their Allies, MacMillan Publishers Pvt. Ltd., Delhi.
4. Alexopoulos, C.J., Mims, C.W., Blackwell, M. (1996). Introductory Mycology, John Wiley and Sons (Asia), Singapore. 4th edition.