

BOTANY M.S.c SYLLABUS

SEMESTER SYSTEM

Semester-Two

Paper	Name of Paper	Max Marks
Paper-I	: Angiosperms-I (Taxonomy and Biosystematics)	50
Paper-II	: Angiosperms-II (Morphology, Embryology and Anatomy)	50
Paper-III	: Genetics and Cytogenetics	50
Paper-IV	: Soil Science and Phytogeography	50
Practicals	: Based on the above theory papers.	100

The students will be required to choose any one of the following papers.

- a) Plant Pathology
- b) Advance Plant Physiology
- c) Forest Ecology
- d) Advance Plant Taxonomy
- e) Advanced Molecular Genetics
- f) Environmental Management and Technology

Practical : Their shall be two practical examinations:

Practical-1 : Based on Ist IInd and IIIrd (General) papers having 75 maximum marks.

Practical-2 : Based on IVth Elective paper having 25 maximum marks.

BOTANY M.Sc SYLLABUS

SECOND SEMESTER

SEMESTER-II

Paper-I : ANGIOSPERMS(TAXONOMY AND BIOSYSTEMATICS)

1. Contribution of Ancient India in taxonomy and classification of Plants.
2. Brief comparative study of the following systems of classification:
 - a) Engler and Prantle
 - b) Hutchinson
 - c) Takhtajan
3. Basic of the Bentham and Hooker's System of Classification.
4. Recent trends in taxonomy
5. International Code of Botanical Nomenclature (ICBN)
6. Rules of Botanical Nomenclature.
7. Field and Herbarium techniques.
8. Biosystematics: Role of the following disciplines in Taxonomy:
 - a) Anatomy
 - b) Embryology
 - c) Cytology
 - d) Phytochemistry
 - e) Palynology
 - f) Numerical Analysis
9. General Knowledge and distinguishing features of the following families:
 - a) Dicotyledons: Magnoliaceae, Nymphyacaceae, Annonaceae, Caryophyllaceae, Tamariaceae, Tiliaceae, Sterculiaceae, Linaceae, Rutaceae, Meliaceae, Vitaceae, Sapindaceae, Anacardiaceae, Fabaceae, Caesalpinaceae, Mimosaceae, Rosaceae, Myrtaceae, Lythraceae, Combretaceae, Onagraceae, Passifloraceae, Sapotaceae, Oleaceae, Apocynaceae, Asclepidaceae, Boraginaceae, Scrophulariaceae, Bignoniaceae, Pedaliaceae, Acanthaceae, Verbaenaceae, Lamiaceae, Polygonaceae, Euphorbiaceae, Moraceae.
 - b) Monocotyledons: Hydrocharitaceae, Orchidaceae, Musaceae, Amaryllidaceae, Arecaceae, Araceae, Commelinaceae, Zingneraceae, Alismaceae, Cyperaceae, Poaceae.

Practical :-

1. Description of local plants in semi-technical language.
2. Identification of taxa upto the level of family.
3. Identification of taxa upto the level of genus and species with the help of flora.

N.B.: Students are required to collect and submit at least 100 plants properly pressed and mounted on herbarium sheets.

M.Sc BOTANY – SECOND SEMESTER

SEMESTER-II

Paper-II : (MORPHOLOGY, EMBRYOLOGY AND ANATOMY)

MORPHOLOGY :

1. Phylogeny of Angiosperms.
2. Morphology of flower with special reference to the morphology of carpel and inferior Ovary.

EMBRYOLOGY:

1. History and present status of embryology.
2. Male and female gametophyte.
3. Fertilization and its control.
4. Endosperm.
5. Embryo and its culture.
6. Apomixis.
7. Polyembryony and its induction.
8. Induced Parthenocarpy.

ANATOMY:

1. Primary meristem organization of shoot and root apices of angiosperms.
2. The cambium and its derivative tissues, differentiation of secondary xylem and secondary phloem.
3. Structure of wood in relation to its weight, strength and durability.
4. Cork cambium and its derivatives, function of cork and abscission layers.
5. Anatomy of floral organs.
6. General structure of plants; cell wall, stomata and secretory structure.

SEMESTER-II

Paper-III : (GENETICS AND CYTOGENETICS)

1. Genes in evolution of species.
2. Gene environmental interaction.
3. Population Genetics, Genetic Counseling.
4. Karyotype: Analysis and evolution (Banding techniques, in-situ Hybridization, FISH, GISH, autoradiography), Genome analysis.
5. Inversion: Cytology and genetic inversions, Role in evolution uses.
6. Chromosomal translocations: Orientation of multiples, uses of interchanges, Robertsonian Translocations, BA translocations, multiple translocations, Renner's complex, Pseudoisochromosomes.

7. Numerical changes: Haploidy-production of haploids, Importance in crop improvement, triploids and tetraploids, cytology and genetics, aneuploids-monosomics and trisomics.
8. Chromosome engineering and crop improvement.
9. Inbreeding depression and Heterosis.

Practical :

1. Preparation of Karyotypes.
2. Study of the effect of chemicals on mitosis.
3. Study of meiosis: Chiasmata frequency in Phlox, Pea and Wheat.
4. Study of the effect of radiation/Chemicals on meiosis.

SEMESTER-II

Paper-IV : SOIL SCIENCE AND PHYTOGEOGRAPHY

A. SOIL SCIENCE

1. The nature of parent material and development of soil.
2. Major processor of soil formation: Calcification, Podzofication and Laterization.
3. Physical properties: Partical system, structure of soul, soil moisture constants, soil aeration, Pf scale.
4. Chemical properties: Soil solution and nutrients, soil Ph, Cation exchange phenomenon, redox potential, acidity, alkanity and salinity of soil.
5. Decomposition and Release of Nutrients: Soil organism, organic matter, over view of decomposition, Process of humification and mineralization, Recycle index, Biogeochemical cycle of N.S and P.

B. PHYTOGEOGRAPHY

1. Plant geography: Distribution patterns, Basics, Endemics, Age Area hyphothesis.
2. Vegetation and floristics regions of India.