

Based on Unified Syllabus of Botany for U.P.State Universities

(B.Sc. I, II, & III year)

All syllabi are effective from July , 2018 Revised on 13.03.2018

Theory Paper's duration is of Three hours and duration of practicals is Four hours

B.Sc. I Year		
Papers	Title of Paper	Max. Marks
Paper I	Diversity of Viruses, Bacteria & Fungi	50
Paper II	Diversity of Algae, Lichens, & Bryophytes	50
Paper III	Diversity of Pteridophytes & Gymnosperms	50
Practical	Practical Syllabus based on theory papers	50
B.Sc. II Year		
Papers	Title of Paper	Max. Marks
Paper I	Diversity of Angiosperms: Systematics, Development & Reproduction	50
Paper II	Cytology, Genetics, Evolution & Ecology	50
Paper III	Plant Physiology and Biochemistry	50
Practical	Practical Syllabus based on theory papers	50
B.Sc. III Year		
Papers	Title of Paper	Max. Marks
Paper I	Plant Resource Utilization, Palynology, Plant Pathology and Biostatistics	50
Paper II	Molecular Biology & Biotechnology	50
Paper III	Environmental Botany	50
Practical	Practical Syllabus based on theory papers	50

Grand Total

600

At least one Field trip in B.Sc. II is compulsory.

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**Subject- Botany
B.Sc. - First Year
Practical**

Time: 4.00 hrs

Max Marks: 50

1- Temporary slide preparation & Identification (Fungi)/Bacteria)	08 Marks
2- Temporary slide preparation & Identification (Pteridophyte/Gymnosperm)	08 Marks
3- Temporary Mount & Identification (Algae/ Bryophyte)	08 Marks
4- Temporary mount of rhizoid/scale/spore; or Gram staining of Bacteria	04 Marks
4- Identify and Comment upon spots (1-6)	12 Marks
7- <i>Viva-Voce</i>	05 Marks
8- Practical class record	05 Marks
Total Marks	50

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**Subject- Botany
B.Sc. -Second Year
Practical**

Time: 4.00 hrs

Max Marks: 50

1- Description, Identification and Classification of given Angiospermic Plant	08 Marks
2- To perform and write the observations, results & conclusion (Physiology)	08 Marks
3- Temporary slide preparation & Identification (Anatomy)/ Temporary Mount (Embryology)/ Biochemistry / Genetics Exercise	04 Marks
4- Cytology/Ecology Exercise	08 Marks
5- Identify and Comment upon spots (1-6)	12 Marks
6- <i>Viva-Voce</i>	05 Marks
7- Practical class record/ chart/ model/ herbarium	05 Marks
Total Marks	50

B.Sc. II year

Paper - I: Diversity of Angiosperms: Systematics, Development & Reproduction M.M. 50

Unit - I

Systematics

Principles of classification, Binomial nomenclature; comparative study of different classification systems, viz. Linnaeus, Bentham & Hooker, Engler & Prantl, Hutchinson, and Cronquist.

Herbarium techniques and important Botanic Gardens.

Unit – II

Taxonomic study of following families and their economic importance:

Dicots; Ranunculaceae, Malvaceae, Brassicaceae, Cucurbitaceae, Rosaceae, Leguminosaceae, Myrtaceae, Rutaceae, Apiaceae, Apocynaceae, Asclepiadaceae, Solanaceae, Convolvulaceae, Acanthaceae, Lamiaceae, Asteraceae, Rubiaceae, Verbenaceae, Euphorbiaceae, and Amaranthaceae. Monocots: Cyperaceae, Poaceae, Arecaceae. Liliaceae.

Unit - III

External morphology of vegetative and floral parts; modifications – phyllodes, cladodes, and phylloclades.

Meristems-kinds study of tissue system - epidermal, ground, and vascular.

Anatomy of roots, stems, and leaves. Cambium - its function and anomalies in roots and stems; root-shoot transition.

Unit – IV

Structure and development of male and female gametophytes – microsporogenesis, microgametogenesis, megasporogenesis, and megagametogenesis, embryo sac types. Double fertilization development of embryo, endosperm development and its morphological nature, apomixis and polyembryony.

Paper II: Cytology, Genetics, Evolution & Ecology

M.M. 50

Unit - I

Cell structure, cell organelles, nucleus, chromosome structure, nucleosome and solenoid model, salivary gland, lampbrush and B chromosomes.

Cell division – mitosis, meiosis; their significance, chromosomal aberrations, cell cycle.

Unit- II

Genetics, laws of inheritance; gene interaction; linkage and crossing over; cytoplasmic inheritance; sex determination.

Unit-III

Mutation- spontaneous, induced mutations, molecular mechanism and evolutionary significance; polyploidy origin, kinds and role in evolution. Evidences and theories of evolution.

Unit - IV

Ecology, relation with other disciplines. Plant types: Hydrophytes - *Hydrilla*, *Eichhornia*, *Nymphaea*, *Typha*.

Xerophytes – *Nerium*, *Casuarina*, *Asparagus*, *Calotropis*, *Parkinsonia*. Plant succession – xeroseres, hydroseres. Ecosystems - concept, basic types, components, & functioning. Food chain, food web, energy flow and productivity.

Paper III - Plant Physiology and Biochemistry.

M.M. 50

Unit - I

Plant and water relationship, colligative properties of water. Water uptake, conduction, transpiration, mechanism and its regulation by environmental variables.

Mineral nutrition : Macro, and micronutrients, their role, deficiency and toxicity symptoms, plant culture practices, mechanism of ion uptake and translocation.

Unit - II

Photosynthesis and Chemosynthesis : photosynthetic pigments, O₂ evolution, photophosphorylation, CO₂ fixation – C-3, C-4 and CAM plants.

Respiration : aerobic and anaerobic respiration, respiratory pathways glycolysis, krebs 'cycle, electron

transport, oxidative phosphorylation, pentose phosphate pathway, photorespiration, cyanide resistant respiration. Lipid biosynthesis and its oxidation.

Unit - III

Nitrogen metabolism : atmospheric nitrogen fixation, nitrogen cycle, nitrogen assimilation,

Growth: general aspects of phytohormones, inhibitors-auxins. kinetin, gibberellins, and ethylene: action and their application; photoperiodism and vernalization. Germination, growth movements, abscission and senescence.

Unit - IV

Biomolecules : Classification, properties and biological role of carbohydrates, Protein and lipids.

Chemistry of nucleic acids, vitamins.

Discovery and nomenclature. Characteristics of enzymes, concepts of holoenzyme, apoenzyme, coenzyme and cofactors. Regulation of enzyme activity, Mechanism of action.

Bioenergetics: Laws of thermodynamics, concept of Gibbs free energy and high energy compounds.