**PSOs of B.Sc. Botany**

* Students will understand the nature and Basic concept of Cell biology, Physiology, Ecology and Taxonomy.
* They will know and understand about the Virus, Bacteria, TMV, Mycoplasma, Actinimycetes and Cyanobacteria.
* They will understand and learn about the Plant kingdom, Diversity of lower and higher plants.
* They will know the application of biological science in Agriculture, Horticulture and Medicine.

**PSOs of M.Sc. Botany**

* They will learn and understand the biodiversity of plants.
* They will know the characters and interrelationship of different groups of Plant Kingdom.
* They will know and understand how the physiological process occurs in the plants and microorganisms.
* They will learn about the Cell biology and Genetics of organisms.
* They will understand in detail about the Biotechnology tissue culture, recent branches in Botany-Ethnobotany and Bioinformatics.

**Department of Botany, Environmental Science and Microbiology**

**Course Outcome**

**B.Sc. 1st Year Annual Pattern**

**Paper-I**

**Diversity of Lower Plants**

* They will be able to understand about general characters of viruses, TMV and T4.
* They will understand the general characters of Bacteriophage, Mycoplasma, Cyanobacteria and Actinomycetes.
* They will learn about the classification of Algae, Its economic importance and life cycles of important algal membranes.
* They will learn to identify the characters of fungi and its classification.
* They will be able to learn and understand about the general characters and classification of Bryophytes and Pteridophytes, Anatomy and Reproduction of their members. Stelar organization in Pteridophytes.

**B.Sc. 1st Year Annual Pattern**

**Paper-II**

**Diversity of Higher Plants**

* They will learn about the general characters and Classification of Gymnosperms, their Geological time table.
* They will learn about the fossilization and Fossil members lyginopteris.
* They will learn to describe the External morphology, Anatomy, Reproduction and life cycle of Cycas, Pinus and Ephedra.
* They will be able to write about the Origin and Evolution of Angiosperms.
* They will know and understand about the Modern trends in Taxonomy.
* They will know about the outline of Bentam and Hooker system of Classification.
* They will learn to describe the different families in semi technical language with economic importance.

**B.Sc. 3rd Sem**

**Structure, Developement and Reproduction in Flowering Plants**

* They will know about the Root system, its anatomy and adaptation.
* They will learn about the Shoot system. Secondary growth in stem and periderm.
* They will understand and learn about the leaf structure both morphological and anatomical.
* They will learn about the Embryology-Male and Female and Gametophytic pistil interaction.
* They will understand about the Double fertilization and Development of Endosperm and Seeds.

**B.Sc. 4th Sem**

**Plant Ecology, Biodiversity and Phytogeography**

* They will know about the Ecosystem and their types.
* They will understand about the biogeochemical cycles.
* They will learn to describe the Morphological, Anatomical and Physiological adaptation.
* They will understand about the Pollution Ecology.
* They will learn to describe the physiochemical properties of soils and its types.
* They will know about the phytogeographical regions of India.

**B.Sc. 5th Sem**

**Plant Physiology and Biochemistry**

* They will learn to describe the water relations.
* They will learn and understand about the Nutrition uptake in plants.
* They will understand the physiological process in plants like Photosynthesis and Respiration.
* They will understand the classification of enzymes their nomenclature and its mechanism.
* They will know about the plant hormones their discovery and mode of actions

**B.Sc. 6th Sem**

**Cell Biology and Genetics**

* They will know about the cell structure and its organelles.
* They will learn the description of chromosome structure, DNA & RNA structure.
* They will learn about the gene interaction and also understand and know that gene is the heredity material.
* They will know about the current knowledge of Biotechnology and Genetic engineering.

**M.Sc. Botany**

**Paper – I**

**Biology and Diversity of Viruses, Bacteria and Algae**

* They will understand the ultra structure of Bacteria and its biological importance.
* They will know about the viruses, and its transmission.
* They will learn and understand the classification of algae into different divisions and the life history of different members.
* They will know about the association of Algae in different field like Fishries, soil forestry etc.

**Paper – II**

**Biological Diversity of Bryophytes, Pteridophytes and Gymnosperms**

* They will know about the classification of Bryophytes and know its interrelationship and phylogeny.
* To learn and understand the classification and characteristics of first vascular cryptograms and life cycle of different members.
* They will learn and understand about the classification, life cycle and economic importance of naked seeded plants Gymnosperms.

**Paper- III**

**Basic Ecology**

* They will understand and learn about the ecosystem and their types.
* They will understand about the community analysis.
* They will learn about the soil structure and their characteristics.
* They will understand and know about the global biogeochemical cycles.

**Paper- IV**

**Biochemistry**

* They will know about the structure and chemistry of proteins, carbohydrates and lipids.
* They will learn about the enzymes; their mode of action, classification etc.
* They will understand and learn about the signal transduction.
* They will know and learn about the chromatography their different types HPLC, TLC etc

**Paper -V**

**Taxonomy of Angiosperms**

* They will know about the classification and nomenclature of plant and its systematic position.
* They will understand the modern trends in Taxonomy especially numerical taxonomy.
* They will understand and learn about the plant used for fuel, fiber, oil and timber etc.
* They will know about the Herbarium and Botanical gardens of India and world.

**Paper -VI**

**Resource Utilization and Conservation**

* They will know and learn about the conservation of plants.
* They will understand the importance of plants and their utilization.
* They will learn to utilize the plants and methods of conservation.

**Paper –VII**

**Biology and Diversity of Fungi**

* They will learn and understand about the general characters and classification of fungi.
* They will know about the beneficial and harmful effects of fungi towards mankind.
* They will learn about the life cycles of different classes of mycology.
* They will know about the industrial importance of fungi

**Paper – VIII**

**Biostatistics and Computer Application**

* They will understand and learn about the statistical analysis.
* They will know about the use of biostatistics used in research.
* They will learn about the use of computer in our daily life.

**Paper-IX**

**Plant Physiology**

* They will understand about the different physiological process occurs in plants.
* They will know about the enzymes and their role in physiological processes.
* The will understand and know about the growth hormones and know about the importance of growth regulators in plants.

**Paper-X**

**Genetics and Molecular Biology**

* They will learn about the DNA (genetic material), its structure and chromosome type.
* They will learn and understand about the mutation and its mechanism.
* They will learn about the description of molecular mechanism of Bacteria.
* They will understand the role of tRNA, they understand about the gene regulation and Lac operon model.

**Paper-XI**

**Plant Reproduction and Development**

* They will know about the structure of root and stem and study in detail about their meristematic tissues.
* They will understand about the root and shoot apex organization.
* They will learn and understand about the structure of leaves.
* They will know about the formation of embryo in male and female gametogenesis, understand about double fertilizatio

**Paper-XII**

**Biotechnology**

* They will know about the scope and history of Biotechnology.
* They will learn and understand about the Genetic Engineering.
* They will learn about the culturing of microorganism for production of biomass.
* They will know about the how to strains are improved and used in different things.

**Paper-XIII**

**Plant cell, Tissue and Organ Culture**

* They will understand about the techniques of tissue culture.
* They will know about the embryo (plant) is formed from the tissues.
* They will learn and understand about the artificial seeds productions and application of plant tissue culture etc

**Paper-XIV**

**Biotechnology and Genetic Engineering**

* They will learn about the Biotechnology and Genetic Engineering is useful to human beings.
* They will know about the microbial genetic manipulation.
* They will learn and understand about the DNA techniques are used in forensic science.

**Paper- XV**

**Ethnobotany**

* They will learn and understand about the ethnobotanical importance of plants.
* They will know about the medicinal value of plant and how to cure various diseases.

**Paper- XVI**

**Applied Mycology**

* They will learn and understand about the Mycology and spoilage of food.
* They will know about the edible mushroom and its cultivation.
* They will learn about the application of mycology in medicine, antibiotics, steroids. Alcohol and beverages.