

Programme & Course outcomes

B.Sc. Botany (Honours)

Core Papers:

BOT-HC-1016: Phycology and Microbiology

1. Detailed knowledge on microbes, viruses and bacteria, and their importance in agriculture and medicine.
2. Knowledge on Algal classification, Economic and ecological importance of Algae.
3. Practical knowledge on structure of T-Phage and TMV, lytic and lysogenic life cycle.
4. Practical knowledge on microscopy of bacteria and algae.

BOT-HC-1026: Biomolecules and Cell Biology

1. Knowledge on structure, classification and physicochemical properties of biomolecules and enzymes.
2. Detailed knowledge on structure, properties and functions of cell and its components.
3. Practical knowledge on properties of cell and cell membrane, DNA staining techniques and microscopy of plant cell.
4. Knowledge on qualitative tests of Biomolecules.

BOT-HC-2016: Mycology and Phytopathology

1. Detailed knowledge on different classes of fungi, their structure, classification, life cycle and reproduction.
2. Knowledge on diseases in plants caused by viruses, bacteria and fungi and biotechnological applications of fungi.
3. Structural analysis of different classes of fungi and their reproductive stages.
4. Knowledge on structures of symbiotic associations (Lichens, Mycorrhiza).

BOT-HC-2026: Archegoniate

1. Detailed knowledge on morphology, anatomy, classification and properties of bryophytes, pteridophytes and gymnosperms.
2. Knowledge on reproduction and economic importance and ecological significance of bryophytes, pteridophytes and gymnosperms.
3. Practical knowledge on morphology and reproductive structures of archegoniates.
4. Spore morphology analysis and detailed knowledge on male and female reproductive structures in gymnosperms.

BOT-HC-3016: Morphology and Anatomy of Angiosperms

1. Knowledge on morphology of angiosperms and developmental biology of plant body.
2. Knowledge on structural and anatomical organization of tissue system in plants and their classification.
3. Practical knowledge on inflorescences and fruits of angiosperms.
4. Practical knowledge on anatomical features of plant body parts.

BOT-HC-3026: Economic Botany

1. Knowledge on morphology, uses and economic importance of crop plants.
2. Knowledge on uses of industrially important plants.
3. Practical knowledge on economically important plant parts and their products.

BOT-HC-3036: Genetics

1. Knowledge on Mendelian concepts in genetics; structure, functions and properties of chromosome; chromosomal aberration.
2. Knowledge on gene structures and gene mutations, population genetics.
3. Practical knowledge on chromosomal mapping and gene interaction studies.
4. Practical visualization of chromosomal anomalies.

BOT-HC-4016: Molecular Biology

1. Detailed knowledge on architecture of nucleic acids, organization of DNA in organisms, models of replication and the factors associated with it.
2. Detailed knowledge on transcriptional and post transcriptional events in a cell, translation of proteins.
3. Practical acquaintance of isolation and quantification of DNA from plants.
4. Knowledge on photographic study of RNA polymerases and RNA modification machinery.

BOT-HC-4026: Plant Ecology and Phytogeography

1. Knowledge on origin, formation and properties of abiotic components of the ecosystem, interactions and adaptation of plants with biotic and abiotic factors.
2. Knowledge on properties of communities in a population and trophical and habitat organization in an ecosystem.
3. Practical knowledge on property analysis of abiotic components of the ecosystem.
4. Practical knowledge on vegetation study and different ecological sites.

BOT-HC-4036: Plant Systematics

1. Knowledge on plant identification and classification systems, plant nomenclature.
2. Knowledge on phylogenetic and evolutionary relationships of angiosperms.
3. Practical knowledge on foliar morphology and taxonomical study of angiosperms.

BOT-HC-5016: Reproductive Biology of Angiosperms

1. Knowledge on detailed morphological and anatomical study of reproductive structures of angiospermic plants.
2. Knowledge on embryology and embryological abnormalities in angiosperms.
3. Structural documentation of reproductive structures of angiosperms.
4. Practical knowledge on developmental biology of embryo and endosperms.

BOT-HC-5026: Plant Physiology

1. Knowledge on mechanisms of water, minerals and nutrient absorption of plants.
2. Knowledge on roles of plant hormones and mechanism of flowering in plants.
3. Practical knowledge on effects of growth regulators on plant parts.
4. Practical knowledge on determination of osmotic and water potential.

BOT-HC-6016: Plant Metabolism

1. Detailed knowledge of metabolic events of photosynthesis and nutrient metabolism.
2. Knowledge of signalling molecules and pathways in the plant cell.
3. Practical knowledge on different types of chromatographic techniques.
4. Estimation of TAN, sugar and protein contents in plant sample.

BOT-HC-6026: Plant Biotechnology

1. Knowledge on applications of tissue culture techniques, construction of recombinant DNA and transformation into hosts, construction of DNA libraries.
2. Knowledge on development of transgenic plants for agricultural or industrial use.
3. Practical utility on isolation of plasmid DNA, its digestion and separation of fragments through gel electrophoresis.
4. Preparation of media for tissue culture techniques and photographic study of plant tissue culture.
5. Photographic study of generating transgenic plants for agriculture.

Discipline Specific Elective (DSE)

Papers BOT-HE-5016: Natural Resource Management

1. Comprehensive knowledge on different types of natural resources and their ecological, economical and socio-cultural values.
2. Basic understandings of land, water and forest resources.
3. Overall knowledge on resource degradation, their judicious use and management for sustainability.
4. Knowledge on biodiversity - its importance, management and Bioprospecting.
5. Knowledge on IPR, and global arena on resource management, conservation and benefit sharing.
6. Hands on experience on the domestic solid waste estimation and determining its impact on land degradation.
7. Hands on experience on forest study using tools like GPS/GIS, and understanding of ecological importance of forest resources.

BOT-HE-5026: Horticultural Practices and Post-Harvest Technology

1. Basic understandings on Horticultural science and its importance in employment generation and socio-economic development.
2. Classification of horticultural crops, identification of potential horticultural crops – their cultivation, production, management and commercialization.
3. Knowledge on horticultural techniques, landscaping and gardening.
4. Overall knowledge on post-harvest technology, disease management, and germplasm management for horticulture.
5. Field knowledge of gardening, nurseries, standing crops of horticultural importance.

BOT-HE-6016: Industrial and Environmental Microbiology

1. Understanding the roles of microbes in industries and environment.
2. Basic knowledge of different kinds of bioreactors and fermentation processes.
3. Knowledge on production processes of some microbial products in industries through site visits.
4. Knowledge on application of enzymes in industries.
5. Diversity and distribution of microbes in air, water and soil.
6. Basic understandings on water microbiology and water analysis methods.
7. Usefulness of microbes in agriculture and bioremediation of contaminated soils.
8. Practical experiences on basic microbiological techniques and handlings.

BOT-HE-6026: Analytical Techniques in Plant Sciences

1. Knowledge on microscopy and imaging in plant science.
2. Principles and application of centrifuge, spectroscopy and chromatography in biology.
3. Basic knowledge on biostatistics including measures of central tendency and dispersions, statistical data analysis and representations.
4. Practical knowledge on microscopy, chromatography, centrifugation and spectroscopy.

BOT-HE-6036: Project Work/Dissertation

1. Practical knowledge on addressing relevant scientific questions through experimentation

Skill Enhancement Papers

BOT-SE-3014: Biofertilizers

1. Basic knowledge on the microbes used as biofertilizer and understand the process of their isolation, identification, mass multiplication, carrier based inoculants and knowledge on Actinorrhizal symbiosis
2. Concept on the general characteristics, isolation, mass multiplication carrier based inoculants of *Azospirillum* and *Azotobacter* also the knowledge on the crop response to *Azotobacter*.
3. Basic knowledge on Cyanobacteria including factors affecting growth of Cyanobacteria, concept on the nitrogen fixation and use of blue green algae in rice cultivation.
4. Brief knowledge on the Mycorrhizal association and understand the details of various types, taxonomy, occurrence, distribution and growth parameters of Mycorrhiza.
5. Details about the organic farming, maintenance and recycling of biodegradable waste material and understand the methods of making bio-compost and vermicompost with application.

BOT-SE-3024: Herbal Technology

1. Concept on the plants used as traditional medicine, and understanding the process of cultivation, harvesting, processing, storage, marketing and utilization of medicinal plants.
2. Brief knowledge on medicinal drugs obtained from plants and comprehensive idea about systematic position, medicinal uses of Tulsi, Ginger, Fenugreek, Indian goose berry and Ashoka.
3. Concept on the phytochemistry of medicinal herbs and identification, utilization of medicinal plants.
4. Basic knowledge on quality control, owing the medicinal properties of herbal drugs including the secondary metabolites and concept of drug adulteration, types, methods of drug evaluation.
5. Understand the process of micro propagation of important medicinal plant species

BOT-SE-4014: Nursery and Gardening

1. Brief idea about objectives, scope, infrastructure and maintenance of Nursery.
2. Concept on structure, types and dormancy of seeds and brief idea about seed storage including types and process and knowledge on seed production technology.
3. Knowledge on various modes of vegetative propagation and maintenance of plants in green house.
4. Brief idea about development and maintenance of gardening including scope and types and understand the various gardening operations including management of pests and diseases.
5. Detail knowledge on managements of seeds and seedlings and concept about cultivation, storage and marketing of important vegetables.

BOT-SE-4024: Floriculture

1. Basic knowledge including history, importance and scope of floriculture.
2. Brief idea about Nursery management and garden operations and knowledge on the terms related to gardening and concept about role of plant growth regulators.
3. Covers the knowledge of various ornamental plants and concept of cultivations of plants in pots and knowledge about Bonsai.
4. Idea about various garden designs and features of such gardens and knowledge about some famous gardens of India.
5. Knowledge about the process of making garden more attractive by altering the existing design in places of public importance, highways and educational institute.

BOT-SE-4034: Intellectual Property Rights

1. Knowledge on IPR, their types and infringement.
2. Understanding about traditional knowledge and their protection, bio-prospecting and biopiracy
3. Knowledge on protection of plant varieties, farmer rights.
4. Knowledge on Information technology related IPR; data, database, chips and domain name protection.

5. Knowledge on novelty, bio-based patenting, and moral issues associated with biotechnological inventions.