

B.Sc., Botany Course Outcome

CORE COURSE I – PLANT DIVERSITY – I (Algae, fungi, Lichens, Plant Protection and Bryophytes)

Outcome

- ➔ Learn about the structure, pigmentation, food reserves and methods of reproduction of Algae
- ➔ Learn about the structure, pigmentation, food reserves and methods of reproduction of Fungi
- ➔ Know about the Economic importance of algae, Fungi and lichen
- ➔ Studied some plant diseases with special reference to the causative agents, symptoms, etiology and control measures.

CORE COURSE II – PLANT DIVERSITY – II (PTERIDOPHYTES, GYMNOSPERMS & PALEOBOTANY)

Outcome

- ➔ Learn about the general characters and classification by K.R. Sporne, stelar evolution in Pteridophytes, heterospory and origin of seed habit.
- ➔ Know about the structure, life history and Economic importance of Gymnosperms.
- ➔ Studied the methods of fossilization and fossil plants

CORE COURSE III – PRACTICAL – I

Objectives

- ➔ Microscopic observation and identification of algae, fungi, bryophytes, lichens, pteridophytes and gymnosperm
- ➔ Observation of crop plants infected by the pathogens included in the syllabus and study of symptoms, causative agents and etiology.
- ➔ Training students to prepare micropreparation and showing the stages of mitosis (Onion root tips) and showing permanent slides/photographs of mitosis and meiosis .
- ➔ Micropreparation of stems, roots and leaf of dicot [*Tridox*] and monocot [*Chloris* & *Canna*]

CORE COURSE IV – CYTOLOGY, ANATOMY AND MICRO TECHNIQUES

Outcome

- ➔ Learn the structure, chemistry and functions of cellular organelles Meristems
- ➔ Gain knowledge on fixation, dehydration, embedding, hand sectioning, microtome sectioning

CORE COURSE V – EMBRYOLOGY OF ANGIOSPERMS AND PLANT TISSUE CULTURE

Outcome

- ➔ Learn about double fertilization and their significance
- ➔ Know about the Structure and development of dicot and monocot embryos.
- ➔ Understand the basic knowledge about tissue culture tools, medium, sterilization and techniques of tissue culture.
- ➔ Learn about the production of Synthetic seeds & significance
- ➔ Study about the role of tissue culture in crop improvement.

CORE COURSE VI – BIOCHEMISTRY, MOLECULAR BIOLOGY AND INSTRUMENTATION

Outcome

- ➔ Learn the properties, Enzyme catalysis and activation energy– Mechanism of enzyme action
- ➔ Study the structure and properties of Macromolecules
- ➔ Gain skill on working principles of pH meter, colorimeter and centrifuge
- ➔ Learn the technique of Electrophoresis & Chromatography

CORE COURSE VII – PRACTICAL – II

1. To dissect out and mount Dicot embryo (*Tridax*)
2. To learn the Plant tissue culture techniques, preparation of culture medium.
3. To know about the production synthetic seeds
4. Measurement of pH of a solution.
5. Estimation of starch in plant tissues. (Colorimetric method)
6. Qualitative test for carbohydrates/protein/lipids

CORE COURSE VIII – TAXONOMY OF ANGIOSPERMS AND ECONOMIC BOTANY

Outcome

1. Learn the types of classifications- artificial, Natural and phylogenetic.
2. Gain knowledge about Botanical Survey of India (BSI).
3. Briefly studied on herbarium techniques.
4. Learn the taxonomic evidences from molecular, numerical and chemicals.
5. Brief studied the economic products with special reference to the Botanical name, family, morphology of useful part and the uses

CORE COURSE IX – GENETICS AND PLANT BREEDING

Outcome

- ➔ Learn about Mendelian principles
- ➔ Know about gene mapping methods & Extra chromosomal inheritance
- ➔ Familiarize about Evolution & Emergence of evolutionary thoughts
- ➔ Gain knowledge on Plant breeding techniques

CORE COURSE X – PLANT ECOLOGY AND BIOSTATISTICS

Course outcome

- ➔ Learn the Approaches to the study of Ecology (Autecology, Synecology and Genecology)
- ➔ Understand the population & Community Ecology - concept of metapopulation
- ➔ Know about the Principles of Toxicology and types of Toxins, sources, metabolism and Biological monitoring
- ➔ Studied various statistical methods of analysis

CORE COURSE XI – PRACTICAL – III (Covering the Core courses VIII, IX & X)

1. Dissect out the floral parts of plants coming under the families prescribed in the theory syllabus.
2. Field study to a floristic rich area is must for a period of three days only under supervision to observe and collect the plants in their natural habitats,
3. Submit minimum of twenty herbarium Plants with a proper field note book with correct identification for external valuation
4. Identify the economic products related to theory syllabus and write Botanical name, family and uses.
5. Observe the genetic variations among inter and intra specific plants.
6. Demonstration of emasculation experiment
7. Arrive primary data from the given sample (leaves/pods) and give diagrammatic representation (Histogram), Calculate mean, median and mode and standard deviation.
8. Ecological field study-Quadrats and Line transect methods of vegetation study.

ELECTIVE COURSE I (A) – MEDICAL BOTANY

Outcome

- ➔ Know about history and relevance of herbal drugs in Indian system of medicine
- ➔ Learn the macroscopic and microscopic characters, chemical constituents, adulterants, therapeutical and pharmaceutical uses of medicinal plants

- ➔ Understand the techniques for drug evaluation (Chemical, Physical and Biological), Phytochemical investigations, standardization and quality control of herbal drugs
- ➔ Know the technique of medicinal gardening - Cultivation practices, marketing and utilization of selected medicinal plants

ELECTIVE COURSE II (B) – HORTICULTURE

Course outcome

- ➔ Learn the importance of horticulture – career and occupational opportunities
- ➔ Know about hydroponics and its importance
- ➔ Learn the techniques of gardening - Types, Methods & Tools
- ➔ Learn about Olericulture - Cultivation of commercial flower crops

CORE COURSE XII – PLANT PHYSIOLOGY AND BIOPHYSICS

Course outcome

- ➔ Know about the requirement of mineral nutrition for plant growth
- ➔ Understand the process of Photosynthesis, Respiration and Nitrogen metabolism
- ➔ Learn about Sensory photobiology
- ➔ Know about the Plant Growth hormones (Auxins, Gibberellins, Cytokinins, Ethylene)
- ➔ Understand the biosynthesis of terpenes, phenols and nitrogenous compounds
- ➔ Understand the concepts in biophysics

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CORE COURSE XIII – MICROBIOLOGY

Learning outcome:

- ➔ Learn about classification, characteristics, ultra structure of Prokaryotic and Eukaryotic microbes
- ➔ Know about organisms and causal factor responsible for plant diseases & methods of studying plant diseases
- ➔ Familiarize with some common plant diseases of India
- ➔ Gain knowledge on Host parasite interaction process

CORE COURSE XIV – BIOTECHNOLOGY

Course outcome

- ➔ Learn the micro and megasporogenesis
- ➔ Know about the morphogenesis and organogenesis in plants

- ➔ Learn the specific and non-specific methods of gene transfer
- ➔ Recombinant DNA technology
- ➔ Applications of Biotechnology in Plant, Animal and Human welfare
- ➔ Biotechnology and IPR, Biosafety, Biopiracy, Bioterrorism and Bioethics.

CORE COURSE XV – PRACTICAL – IV

1. Determination of Osmotic Pressure – Plasmolytic method.
2. Measurement of Water Potential – Chardakov's method [Falling drop method]
3. Measurement of Water Potential – Gravimetric method
4. Determination of Suction Pressure – Weighing method.
5. Rate of Photosynthesis – *Hydrilla* Experiment of Willmont's Bubbler using different colour filters.
6. Rate of Photosynthesis using different concentrations of sodium-bicarbonate (Bubble method).
7. Extraction and separation of Photosynthetic Pigments by Chromatography techniques (any one method).
8. Determination of chlorophyll pigments by Arnon method
9. Preparation of Nutrient Agar, Agar plates, Slants, Potato Dextrose Agar medium – PDA
10. Motility of Bacteria – Hanging Drop Technique
11. Preparation of biogas from cow dung.

ELECTIVE COURSE III (A) – BIOFERTILIZERS & BIOPESTICIDES

Outcome

- ➔ Learn the characteristics, identification, cultural methods and maintenance of Azospirillum, Azotobacter, Azolla and Anabaena.
- ➔ Know about Mycorrhiza – VAM association, types, occurrence, collection, isolation and inoculum production.
- ➔ Studied the method of large scale production of biofertilizer & Organic farming
- ➔ Get knowledge on Biopesticides - characteristics, physiology, mechanism of action and application.

ELECTIVE COURSE III (B) - BIOINFORMATICS

Outcome

- ➔ Learn the phylogenetic analysis –molecular evolution
- ➔ Studied the application of Bioinformatics in Drug designing