

DEPARTMENT OF BOTANY

Programme outcome

This branch of science enables a huge opportunity regarding the knowledge of:

1. The economic importance of algae, fungi and lichen and some plant diseases with special reference to the causative agents, symptoms, etiology and control measures.
2. Micro preparation of stems, roots and leaf of dicots.
3. About the production of synthetic seeds and their significance.
4. About the role of tissue culture in crop improvement.
5. The economic products with special reference to the botanical name, family, morphology of useful parts and their use
6. Idea on sensory photobiology
7. Applications of biotechnology in plant, animal, human welfare and IPR, biosafety, biopiracy, bioterrorism and bioethics.
8. Study of medical science, paramedical science, bio-technology, forestry, and researches in all such fields.

Programme specific outcome

In this programme students know about:

1. Basics and importance of microbiology.
2. Bacterial nutrition and growth are very important for their useful for growth and control in diseases.
3. Knowledge on different types of algae and their application on different fields.
4. The basics of cell and its components.
5. Develop an understanding of microbes, fungi and lichens and appreciate their adaptive strategies.
6. Demonstrate proficiency in the experimental techniques and methods of appropriate analysis of bryophytes, pteridophytes, gymnosperms.
7. Examine the internal anatomy of plant systems and organs
8. Evaluate the adaptive and protective systems of plants
9. Understand core concepts of economic botany and relate with environment, populations, communities, and ecosystems
10. Have conceptual understanding of laws of inheritance, genetic basis of loci and alleles and their linkage
11. Examine the structure, function and replication of DNA.
12. Analysis of the structures and chemical properties of DNA and RNA through various historic experiments.
13. To understand core concepts of biotic and abiotic.

14. To analyses the Phyto geography or Phyto geographical division of India
15. To classify plant systematics and recognize the importance of herbarium and virtual herbarium.
16. To interpret the rules of ICN in botanical nomenclature
17. To know the structure and development of dicot and monocot embryos.
18. To understand water relation of plants with respect to various physiological processes.
19. To differentiate anabolic and catabolic pathways of metabolism
20. To interpret the biological nitrogen fixation in metabolism
21. To learn the micro and mega sporogenesis
22. Students will acquire communication, soft skill, social awareness and entrepreneurship skill.
23. It aims for work within the fields of research, public administration, governmental and non-governmental organizations, education and industry.
24. To understand the different classifications of horticultural crops, nursery management, and use of technology in horticulture.
25. To make the students aware about conservation and sustainable use of plants.
26. To address the socio-economical challenges related to plant sciences.

Semester-I

Core -1 (microbiology and phycology)

Course Outcome

1. Microbial world, microbial nutrition, growth and metabolism with practical.
2. Virology and immunology with practical.
3. Bacteria and cyanobacteria and their economic importance
4. Evolutionary significance of prochloron
5. Different types of algae with their ecology and evolution and their role in environment, agriculture, biotechnology and industry

Core- 2 (Biomolecules and Cell Biology)

Course Outcome

1. Water, p^h, buffer, chemical bonds and structure and function of different biomolecules including proteins, lipids, nucleic acids, and carbohydrates.
2. Basic concepts of enzymes and their mechanism of action
3. Acquire knowledge base of metabolic pathways occurring inside living cells.
4. This introductory section aims to give the student an overview of basic cell biology including cell structure, types and its application in and around the work place.
5. Key components that constitute living cells, dynamic attributes of cell including cell interaction, cell adhesion and cellular signaling.

6. Structure of DNA and RNA and their role in living body
7. Biological roles of protein
8. Structure and function of lipid
9. The significance of cell division inside living body

Semester-II

Core- 3 (Mycology and Phytopathology)

Course outcome

1. The students will study different types of fungi along with their affinities with plants.
2. They will study their classification along with ecology and classifications.
3. Role of fungi in biotechnology and mushroom cultivation.
4. Application of fungi in food industry in pharmaceutical preparations and in biological control
5. Geographical distribution of diseases and host- pathogen relationship
6. Prevention and control of plant diseases

Core- 4 (Archegoniates)

Course Outcome

1. Unifying features of archegoniates.
2. Origin of land plants and adaptation to land habit
3. Range of thallus organization, ecology and economic importance of bryophytes
4. Classifications, evolution, stellar evolution and economic importance of pterophytes and gymnosperms
5. Geological time scale, fossils and fossilization process

Core- 5 (anatomy of angiosperms)

Course Outcome

1. Scope of plant anatomy, applications in systematic, forensics and pharmacognosy
2. Idea on tissue and cyto differentiation of tracheary elements
3. Organization of root, shoot and stem apices
4. Seasonal activity of cambium
5. Normal and anomalous secondary growth
6. Adaptive and protective tissue systems and also secretory tissue system
7. Anatomical adaptations of xerophytes and hydrophytes

Semester-III

Core- 6 (Economic Botany)

Course outcome

1. Centers of origin, domestications, loss of genetic diversity, evolution of new crops/ varieties and importance of germplasm activity
2. Economic importance of cereals, legumes, sugars and starches, spices
3. Therapeutic and habit-forming drugs
4. Uses and health hazards of tobacco
5. Classification, extraction, uses and health implications of oil-bearing seeds
6. Rubber, timber and fibre yielding plants and their uses and extraction

Core - 7 (Genetics)

Course Outcome

1. Describing gene linkage sex influence and linkage.
2. Explaining genetic anomalies caused by changes in chromosome number.
3. Summarizing genetic anomalies caused by changes in chromosome structure.
4. Describing genetic deviations from mendelian principles of genetic analysis.
5. Differentiating between essential genes and both dominant and recessive lethal alleles.
6. Explaining the environmental influences on gene expression.
7. Listing examples of non-mendelian inheritance.

Semester-IV

Core- 8 (Molecular Biology)

Course Outcome

1. Biochemical nature of nucleic acids
2. The process and models of DNA replication and the involvement of enzymes
3. Deciphering and salient features of genetic code
4. Processing and modification of RNA
5. Mechanism of transcription and its regulation
6. The process of transcription and various steps of protein synthesis

Core- 9 (Plant Ecology and Phytogeography)

Course Outcome

1. Inter-relationships between the living world and the environment
2. Role of climate in soil development
3. States of water in environment and its importance
4. Structural and functional aspects of an ecosystem
5. Principles of phytogeography
6. Phytogeographical division of India

Core- 10 (Plant Systematics)

Course Outcome

1. Identification, classification and nomenclature of plants.
2. Taxonomic hierarchy and species concept.
3. Principles and rules of botanical nomenclature.
4. Systems of classification by eminent scientists.
5. Phylogenetic tree and cladogram for the study of. phylogeny of angiosperms.

Semester-V

Core- 11 (Reproductive Biology of Angiosperms)

Course Outcome

1. Mechanism of pollination and role of anther by studying pollen biology
2. Types and structure of mature embryo sac
3. Basic concepts and methods to overcome self- incompatibility
4. Intra ovarian and in vitro pollination
5. Embryo and endosperm relationship
6. Importance and dispersal mechanism of seed
7. Causes and application of polyembryony and apomixis

Core- 12 (plant physiology)

Course Outcome

1. Ascent of sap and mechanism of stomatal movement
2. Trans membrane pathway of water movement

3. Source-sink relationship
4. Mineral nutrition, role of essential elements and mineral deficiency symptoms in plants
5. Chemical natures and bio assay of plant hormones
6. Physiological roles of auxin, gibberellin, cytokinin etc.

Semester-VI

Core- 13 (Plant Metabolism)

Course Outcome

1. Anabolic and catabolic pathways of plant metabolism
2. Mechanism of signal transduction
3. Carbon assimilation in green plants and role of photosynthetic pigments for this process
4. Carbon oxidation
5. Mechanism of ATP synthesis taking into consideration of different experiments
6. Gluconeogenesis and its role in mobilization of lipids during seed germination
7. Physiology and biochemistry of nitrogen fixation

Core - 14 (Plant Biotechnology)

Course Outcome

1. The processes and applications of recombinant DNA technology.
2. The role of restriction endonucleases in gene manipulation.
3. The applicability of different kinds of cloning vectors.
4. The use of genomic libraries in gene detection and characterization.
5. the process of restriction mapping.
6. the process of southern blot analysis.
7. Summarizing methods used for DNA sequencing.
8. the principles of the polymerase chain reaction (PCR) and their applications.

DSE- 1 (Analytical Techniques in Plant Sciences)

Course Outcome

1. Imaging and related techniques (light microscopy, fluorescence microscopy, flow cytometry).
2. Cell fractionation and centrifugation.
3. Chromatography, x-ray crystallography and electrophoresis
4. Principles and application of spectrophotometry in biological research.
5. Characterization of proteins and nucleic acids

DSE- 2 (Natural Resource Management)

Course Outcome

1. Types and sustainable utilization of natural resources.
2. Utilization and management of land.
3. Water harvesting technology.
4. Significance, types, threats and management strategies of biological resource.
5. Renewable and non renewable sources of energy.
6. Waste management and national and international efforts in resource management and conservation.

DSE- 3 (Horticultural Practices and Post-Harvest Technology)

Course Outcome

1. Scope and importance and branches of horticulture
2. Types, classification and salient features of some ornamental plants
3. Production, origin and distribution of vegetable and fruit crops
4. Techniques and limitations of horticulture
5. Importance of post harvest technology in horticultural crops
6. Disease control and management of horticultural crops

DSE- 3 (project)

Course Outcome

1. To select the topic.
2. Literature survey for the topic of the project.
3. Skill in practical work, experiments, use of biological tool and techniques.
4. Handle instruments for analysis and discuss their experimental results.
5. to prepare project reports and present it using power point presentation.
6. Work within a small team to achieve a common research goal.