

DEPARTMENT OF BOTANY

PROGRAMME OUTCOME

After successful completion of three-year degree program in Botany a student shall be able to-

PO-1. Know about different types of lower & higher plants their evolution in from algae to angiosperm & also their economic and ecological importance.

PO-2. Comprehend about cell organelles & their functions

PO-3. Know about chemical properties of nucleic acid and their role in living systems.

PO-4. Internalize laws of inheritance, various genetic interactions, chromosomal aberrations & multiple alleles.

PO-5. Understand Structural changes in chromosomes.

PO-6. Describe morphological & reproductive characters of plant and also identified different plant families and classification.

PO-7. Use modern Botanical techniques and decent equipments.

PO-8. Inculcate the scientific temperament in the students and outside the scientific community.

PROGRAMME SPECIFIC OUTCOME

PSO-1. Acquisition of fundamental Botanical knowledge through theory and practicals.

PSO-2. Explain basis plant of life, reproduction and their survival in nature.

PSO-3. Understand role of living and fossil plants in our life.

PSO-4. Understand good laboratory practices and safety.

PSO-5 Awareness about cultivation, conservation and sustainable utilization of biodiversity.

PSO-6. To know advance techniques in plant sciences like tissue culture, Phytoremediation, plant disease management, formulation of new herbal drugs etc.

PSO-7 Students able to start nursery, mushroom cultivation, biofertilizer production, fruit preservation and horticultural practices.

COURSE OUTCOME

After completion of these courses students should be able to-

Semester-I

Core -1 (microbiology and phycology)

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.

Semest-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.