

B.Sc (Botany)

Programme Outcomes

After successful completion of “Three Year Degree Program” in Botany, a student will be able to:

- Understand basic characteristics of plants and microbes (Bacteria, Viruses etc.).
- Will be aware about different environmental issues cause by deforestation and misuse of natural resources.
- Demonstrate, solve and develop an understanding of major concepts in all disciplines of botany.
- Will gain knowledge about applications of plant in different field (Medical science, Ayurveda and Biotechnology).
- Solve the problem and also think methodically, independently and draw a logical conclusion.
- Develop a broad foundation in botany that stresses scientific reasoning and analytical problem solving with a molecular perspective.
- Get exposure of theoretical knowledge about working of variety of experimental techniques.
- Learn the laboratory skills and safely to transfer and interpret knowledge entirely in the working environment.
- Understand the concept of botany to inter relate and interact to the other subject like chemistry, physics etc.
- Acquainted with various opportunities related to botany available in the government services like forest range officer, environmentalist, plant taxonomist, conservationist, food or fruit grower, researcher etc.

Programme Specific Outcomes

B.Sc.-I: After completion of one year syllabus students will have:

- i. Enhancement in their basic knowledge about cryptogams and phanerogams.
- ii. They will be able to understand the basics of different branches of botany, viz. cytology, genetics etc.
- iii. Understanding of various topics which deal with evolution and classification of plants, their cell structure and function and genetic behaviour.
- iv. Develop the theoretical and practical knowledge through the experiments.

Course Outcomes

Paper I (Group 1-7) Plant Kingdom

After successful completion of course of paper I, the students will be able to:

- i. Get more clear ideas about the origin and evolution of plant on the earth.
- ii. They will know the basic concept about how the plants are classified under different groups.
- iii. Will know the clear idea about various mode of growth and reproduction of different plant groups.
- iv. Understand the concept of Palaeobotany.
- v. Get the knowledge about economic importance of plants.

Paper II (Group A): Cytology

After successful completion of course paper II (group A) the students will be able to:

- i. Understand the cellular structure of plant.
- ii. Understand major concept of function of different organelles of plant like chloroplast, mitochondria, E.R. etc.
- iii. Understand basic idea about microscopy and different form of microscope.
- iv. Understand how to separate different components like chlorophyll, amino acid, nucleic acid present in plant.

Paper II (Group B): Genetics

After successful completion of course paper II (Group B), the students will be able to:

- i. Understand the concept about Genes and Inheritance.
- ii. Understand major concepts of evolution and diverse forms of life on the earth.
- iii. Understand cancer and genetic disease.
- iv. Understand its application in various field like crop improvement, gene therapy.

Practical paper based on paper I & II

After successful completion, the students will be able to:

- i. Understand to handle the microscope.
- ii. Understand the procedure of collecting specimens, their preservation.
- iii. Understand the methods of slide preparation.
- iv. Understand to identify microscopic plants after observing under microscope.

- v. Understand to make a slide and see different stages of cell division.
- vi. Understand the squash technique.
- vii. Understand to calculate offspring ratio after crossing.
- viii. Understand techniques of emasculation and pollination.

Programme Specific Outcomes

B.Sc.-II: After completion of two-year syllabus students will have:

- i. Further advancement in their knowledge of botany of each branch.
- ii. They will get to know and understand the topics of different branches of botany, viz. plant physiology, environment ecology, plant resource utilization and organization of the higher plant body in a more detailed and broader way.
- iii. Develop novel theoretical and practical knowledge of the subject through the experiments.

Course Outcomes

Paper III (Group A): Plant Physiology

After successful completion of course Paper III (Group A), the students will be able to:

- i. Get deeper understanding about the sub-topics of botany.
- ii. Understand major concepts about plant functioning.
- iii. Understand and define various topics of plant physiology like: plant-water relation, mineral nutrients essential for plant and their translocation etc.
- iv. How's the plant grows from seedlings and what are the main factors and hormones necessary for that.

Paper III (Group B): Environmental ecology

After successful completion of course Paper III (Group B), the students will be able to:

- i. Understand clearly about the sub topics of ecology.

- ii. Understand different aspects of biotic and abiotic ecological factors like soil, water, air, producer and consumers.
- iii. Understand that, how abiotic factors and biotic factors are affecting each other and balancing the environment.
- iv. Understand the concept of adaptation and inter/intra relationship within different population.
- v. Understand the richness of diversity of India.

Paper IV (Group A): Organization of the plant body

After successful completion of course Paper IV (Group A), the students will be able to:

- i. Understand the different form and habit of different parts of plant like roots, shoots and leaves.
- ii. Understand the tissue level organization of plant.
- iii. Understand basic concept of anther and embryo formation and procedure of their culture.
- iv. Understand how some plants shows abnormal type of growth in xylem and phloem.

Paper IV (Group B): Plant Resource Utilization

After successful completion of course Paper IV (Group B), the students will be able to:

- i. Know the diversity of plant in India and how the peoples are using these natural resources for their livelihood and economic wealth.
- ii. Aware about the centre of origin of plants and their abundance in India.
- iii. Know about different plant group, which are fibre producing, oil producing etc.
- iv. Understand the process of waste treatment and biogas production.

Practical paper based on paper III & IV

After successful completion, the students will be able to:

- i. Prove practically that CO_2 , light and water is essential for photosynthesis.
- ii. Calculate T/A ratio
- iii. Separate pigments and different molecules present in the plant.
- iv. Make quadrat and calculate diversity of particular plant.
- v. Understand the adaptation in plants through their internal structure.
- vi. Dissect embryo and understand the structure of that.

Programme Specific Outcomes

B.Sc.-III: After completion of two-year syllabus students will have:

- i. Further advancement in their knowledge of botany of each branch.
- ii. They will get to know and understand the topics of different branches of botany, viz. biochemistry of plant system their molecular structure and plant biotechnology, systematics and nomenclature, environmental biology, microbiology and plant pathology in a very broader and deeper way.
- iii. Develop novel theoretical and practical knowledge of the subject through the experiments.

Course Outcomes

Paper V (Group A): Biochemistry

After successful completion of course Paper V (Group A), the students will be able to:

- i. Get deeper knowledge about chemistry of water like their interaction, bond structure and properties.
- ii. Understand the concept of free energy and redox potential.
- iii. Know about the functioning of physiological activity triggered by enzyme, enzyme's nomenclature and classification etc.
- iv. Understand the types of different complex molecules proteins, carbohydrate, fat, lipid etc.
- v. Understand the composition, structure and function of nucleic acid i.e., DNA, RNA.

Paper v (Group B): Molecular Biology

After successful completion of course Paper v (Group B), the students will be able to:

- i. Understand clearly about the sub topics of molecular biology.
- ii. Understand that how DNA is genetic material.
- iii. Know how genetic code is formed, which differ each individual in a race.
- iv. Understand how we can construct a completely new form of and organism through recombinant.
- v. Understand the importance of immune system and its functioning.

Paper v (Group C): Plant Biotechnology

After successful completion of course Paper V (Group C), the students will be able to:

- i. Understand concept and scope of plant biotech.
- ii. Get idea about plant tissue culture and development of better plant through this.
- iii. Understand how to developed an improved variety of plant from parental one.
- iv. Get knowledge to develop a clone and store useful germplasm for future purpose.
- v. Get idea about development of transgenic plants.

Paper VI (Group A): Microbiology

After successful completion of course Paper VI (Group A), the students will be able to:

- i. Get idea about systematic position of microbes and its classification.
- ii. Perform sterilization method, preparation of culture media, staining of bacteria etc.
- iii. Know about history, structure, classification, nutrition, reproduction of bacteria.

- iv. Understand the role of microbes in industries like production of milk, antibiotic, alcohol and food processing etc.
- v. Know the definition, scope and concept of Aerobiology.
- vi. Perform culture like mushroom culture.

Paper VI (Group B): Plant Pathology

After successful completion of course Paper VI (Group A), the students will be able to:

- i. Know about pathogens.
- ii. Know the role of toxin and enzyme in plant disease.
- iii. Know some important plant disease of rice, wheat brinjal etc., its etiology and control.

Paper VII (Group A): Systematics of Angiosperm

After successful completion of course Paper VII (Group A), the students will be able to:

- i. Understand the basic of systematic and different forms of systematic of angiospermic plants.
- ii. Know to prepare herbarium, its importance and role in identification of plants.
- iii. Understand the nomenclature system ICBN.
- iv. Get idea about general account, the origin and evolution of angiosperms.

Paper VII (Group B): Environmental Biology

After successful completion of course Paper VII (Group B), the students will be able to:

- i. Understand the basic concept of environment.
- ii. Know the components of environment and its utilization.

- iii. Understand the impact of human activity.

Practical paper (VIII) based on paper V, VI & VII

After successful completion, the students will be able to:

- i. Understand to demonstrate the presence of any one of the different components.
- ii. Understand to estimate DNA and RNA.
- iii. Prepare culture media
- iv. Prepare solid culture media.
- v. Perform gram staining