

Program Outcome

B.Sc. (Honours/Major) in Botany

National Education Policy (NEP)

Upon successful completion of a Bachelor of Science with Honours in Botany program, graduates will acquire the following skills:

Knowledge and Understanding:

Plant Biology: Possess a comprehensive understanding of plant morphology, anatomy, physiology, metabolism, development, reproduction, and evolution.

Diversity and Classification: Identify and classify plants from different taxonomic groups.

Ecology and Plant Communities: Understand the interaction between plants and their environment, analyze plant communities, and assess the impact of environmental change on plant life.

Biotechnology and Applied Botany: Apply their knowledge of plant science to areas such as agriculture, horticulture, forestry, environmental conservation, and medicine.

Scientific Methods: Design and conduct scientific experiments, collect and analyze data, and interpret results effectively.

Cognitive Skills:

Critical Thinking and Problem-Solving: Analyze complex biological problems, propose solutions, and evaluate their feasibility.

Scientific Reasoning and Decision-Making: Apply scientific principles to draw conclusions and make informed decisions based on evidence.

Research Skills: Formulate research questions, access and evaluate scientific literature, conduct independent research, and communicate findings effectively.

Practical Skills:

Laboratory Techniques: Perform a variety of laboratory techniques in plant biology, including plant identification, microscopy, biochemical assays, plant extraction, molecular biology, and tissue culture.

Fieldwork and Data Collection: Conduct field studies, collect plant specimens, and record data accurately.

Data Analysis and Interpretation: Use statistical software and other tools to analyze and interpret biological data.

Communication Skills: Write scientific reports, prepare presentations, and effectively communicate complex scientific concepts to diverse audiences.

Personal and Interpersonal Skills:

Time Management and Self-Discipline: Effectively manage their time, set goals, and independently pursue their academic and professional development.

Teamwork and Collaboration: Work effectively as part of a team in research and learning environments.

Ethical Awareness and Professional Conduct: Understand and adhere to ethical principles in scientific research and professional practice.

Lifelong Learning: Maintain a commitment to lifelong learning and adapt to the rapidly changing field of Botany.

Additionally, graduates of a BSc. Honours in Botany program may be able to:

- Pursue postgraduate studies in plant science, including M.Sc or M.Tech degrees, PhD programs, or professional masters programs.
- Seek employment as scientist, academicians, and educators in different institutions such as Research Institutes, Universities, Colleges, Schools, Government Organizations, Forensic Laboratories, MNCs, and NGOs.
- Seek future career as an officer at Indian Forest Service, State Forest Service, Food Corporation of India, Directorate of Plant Protection, Quarantine, & Storage, Botanical Survey of India, Ministry of Petroleum and Natural Gas,

Kolkata Municipal Corporation, Biodiversity Board, Tea Board, Pollution Control Board and so on.

- Develop entrepreneurial skills and create their own businesses in areas related to plant science.
- Become informed advocates for environmental conservation and sustainable practices.

B.Sc. (Minor) in Botany

A Botany Generic Elective/Minor course can be a valuable addition to any student's academic program. It can provide students with a strong foundation in plant biology, develop important skills, and foster a love for the natural world.

Increased knowledge and understanding of the plant world: Students will gain a strong foundation in plant biology, including plant anatomy, physiology, ecology, and evolution. They will be able to identify and classify different types of plants, understand how plants function, and appreciate the role of plants in the environment.

Development of critical thinking and problem-solving skills: Students will learn to analyze scientific data, draw conclusions, and solve problems related to plants. They will be able to evaluate different viewpoints and make informed decisions about plant-related issues.

Improved communication skills: Students will learn to communicate effectively about plants, both orally and in writing. They will be able to present their findings in a clear and concise manner to both scientific and non-scientific audiences.

Enhanced appreciation for the natural world: Students will develop a greater appreciation for the beauty and complexity of the plant world. They will understand the importance of plants in the environment and be able to make informed decisions about their own impact on the planet.

Preparation for further study or careers in Botany: Students who take a Botany generic elective course will be well-prepared to pursue further study in botany or a related field. They will also be prepared for careers in plant research, education, conservation, or agriculture.

Course Outcome of Botany under National Education Policy (NEP)

DS1: Microbiology & Phycology

Upon successful completion of this paper, students will gain a comprehensive understanding of the diverse world of algae and microorganisms, their interactions with plants, and their significance in the environment and human health.

Students will be able to identify and classify common algae and microorganisms using microscopic and biochemical techniques.

Students will develop skills in aseptic techniques and culture methods for studying microorganisms.

DS2: Mycology and Phytopathology

Upon completion of this paper, students will gain in-depth knowledge about the vast world of fungi that constitutes a distinct kingdom of their own.

Students will also learn about different types of plant diseases, disease cycles and factors affecting disease development, mechanisms of disease resistance as well as the principles of plant disease management.

MA1: Biodiversity (Microbes, Algae, Fungi, and Archegoniatates)

Upon successful completion of this paper, students will gain a comprehensive understanding of the diverse world of algae and microorganisms, their interactions with plants, and their significance in the environment and human health.

Students will gain in-depth knowledge about the vast world of fungi that constitutes a distinct kingdom of their own. Students will also learn about different types of plant diseases, disease cycles and factors affecting disease development, mechanisms of disease resistance as well as the principles of plant disease management.

Students will gain a comprehensive understanding of the Archegoniatates (Bryophytes and Pteridophytes), their morphological, anatomical, and physiological features.

They will be able to analyze the evolutionary relationships between different archegoniate groups and their significance in plant evolution as well as appreciate the ecological roles and economic importance of archegoniates in diverse ecosystems.

MA2: Plant Ecology and Taxonomy

Upon successful completion of this course, students will grasp plant interactions with environment & communities, analyze factors shaping plant distribution globally & regionally, and master biogeographical patterns & vegetation types worldwide.

They will master classification principles, herbarium techniques, and molecular tools for evolutionary analyses. Students refine field botany skills, contribute to biodiversity studies, and critically evaluate taxonomic literature.

SEC: Tissue Culture Technique & Micropropagation

Students will gain hands-on expertise in plant tissue culture, mastering aseptic techniques, diverse micropropagation methods, media optimization, plantlet acclimatization, and economic analysis. They will develop critical thinking skills to troubleshoot challenges and a passion for plant science and sustainable development. The course will equip the students with essential skills for careers in plant biotechnology, research, and agriculture.

SEC: Technique in Vermicomposting

By the end of this course, students will be able to:

- Describe the benefits of vermicomposting and its role in sustainable waste management.
- Set up and manage a vermicomposting bin, selecting the right bedding materials, food scraps, and earthworm species.
- Monitor and maintain optimal conditions for vermicompost production, including moisture, temperature, and aeration.
- Harvest and use finished vermicompost as a nutrient-rich soil amendment for gardens and houseplants.
- Troubleshoot common problems in vermicomposting and identify solutions.
- Promote vermicomposting as a valuable practice for individuals, communities, and the environment.

In addition to these skills, you will also gain a deeper understanding of the ecology of earthworms and their importance in soil health. You will be able to apply your knowledge and skills to start your own vermicomposting project, reducing your waste footprint and creating valuable fertilizer for your plants.

