# Vidyanagar College

## Department of Botany

### Vidyanagar, South 24-Parganas

## Programme Outcomes (PO) for B.Sc. Botany

**PO1. Core Knowledge of Plant Sciences**

Develop a comprehensive understanding of plant diversity, morphology, anatomy, reproduction, physiology, biochemistry, ecology, and evolution as outlined in the CU Botany curriculum.

**PO2. Understanding Plant Diversity and Systematics**

Gain the ability to identify, classify, and interpret major plant groups—including algae, fungi, bryophytes, pteridophytes, gymnosperms, and angiosperms—using modern taxonomic principles and phylogenetic frameworks.

**PO3. Laboratory and Field Competence**

Acquire hands-on skills in microscopy, plant identification, herbarium techniques, physiological experiments, biochemical estimations, molecular biology tools, and ecological field methods.

**PO4. Scientific Reasoning and Problem Solving**

Apply scientific principles to analyse plant structures, functions, and interactions; interpret experimental data; and solve biological problems using logical and evidence-based approaches.

**PO5. Research Aptitude and Methodology**

Develop the ability to formulate hypotheses, design experiments, collect and analyse data, and interpret results following standard scientific methodology.

**PO6. Use of Modern Tools and Technology**

Gain proficiency in laboratory instruments, molecular techniques, bioinformatics tools, statistical software, and digital resources relevant to plant sciences.

**PO7. Environment, Ecology, and Sustainability**

Understand ecological principles, biodiversity patterns, conservation strategies, and the role of plants in environmental sustainability, climate resilience, and ecosystem functioning.

**PO8. Social and Ethical Responsibility**

Recognize the societal relevance of plants in agriculture, industry, healthcare, and environmental management, while adhering to ethical practices in research and biodiversity conservation.

**PO9. Communication and Teamwork**

Develop effective communication skills for presenting scientific information and work collaboratively in laboratory, field, and interdisciplinary settings.

**PO10. Lifelong Learning and Employability**

Cultivate the ability to pursue higher studies, research, and careers in plant sciences, biotechnology, environmental management, agriculture, and related sectors, while engaging in continuous learning.

## Course Outcomes (CO) for B.Sc. Botany

**CO1. Plant Identification and Classification**

Students will be able to identify major plant groups and place them within appropriate taxonomic and phylogenetic frameworks using morphological and molecular characters.

**CO2. Understanding of Plant Structure and Function**

Students will interpret plant morphology, anatomy, and developmental patterns and relate them to physiological and ecological functions.

**CO3. Application of Scientific Method**

Students will formulate hypotheses, design experiments, collect data, and analyze results to evaluate biological questions in plant sciences.

**CO4. Competence in Laboratory Techniques**

Students will demonstrate proficiency in microscopy, histology, physiological assays, biochemical estimations, microbial techniques, and molecular biology protocols.

**CO5. Data Analysis and Interpretation**

Students will apply statistical tools, graphical methods, and quantitative reasoning to analyze biological data and draw meaningful conclusions.

**CO6. Accessing and Evaluating Scientific Literature**

Students will be able to search, interpret, and critically evaluate primary research articles, reviews, and scientific databases relevant to botany.

**CO7. Understanding Evolution and Biodiversity**

Students will explain evolutionary processes, phylogenetic relationships, and the origin and diversification of plant lineages using comparative biology.

**CO8. Ecology and Environmental Biology**

Students will understand ecological interactions, population and community structure, nutrient cycles, and environmental issues, and relate them to conservation strategies.

**CO9. Plant Physiology and Biochemistry**

Students will explain plant metabolic pathways, physiological responses, stress biology, and biochemical processes at cellular and molecular levels.

**CO10. Genetics and Molecular Biology**

Students will understand gene structure, inheritance patterns, genome organization, molecular mechanisms of gene expression, and modern genetic tools.

**CO11. Biotechnology and Applied Botany**

Students will apply knowledge of tissue culture, recombinant DNA technology, plant breeding, and industrial applications of microbes and plants.

**CO12. Communication and Scientific Presentation**

Students will present scientific information effectively through oral presentations, posters, laboratory reports, and written assignments.