

Department of Botany

Three years Bachelor Program. BSc. Bio

PROGRAMME OUTCOMES (POs):

PO-1: Knowledge: the students will be gain knowledge in the field of Botany and applied areas and after completion of course they

PO-2: Problem Analyses: At the end of the program, students will be able to identify, formulate and analyze scientific problems and reach concrete solutions using various principles of Genetics and sciences.

PO-3: Designing Solutions: Having acquired knowledge of subjects, students are trained to think out of the box, design and conduct an experiment or a series of experiments that demonstrate their understanding of the methods and processes involved.

PO-4: Modern tool usage: As an outcome of PO-1, PO-2 and PO-3, learners are trained to create, select, and apply appropriate techniques, resources and IT tools in the analysis and synthesis of data within limitations.

PO-5: Communication Development: Learners will be able to communicate effectively on scientific issues with the scientific community and society at large in writing effective reports and designing documentation, make effective presentations and give and receive instructions.

PO-6: Employability: At the end of the program students will be able to increase their employability through subject knowledge and additional skills.

PO-7: Ethics: In this program, this process is enabled through courses and facilitators who integrate the teaching of ethics in everyday pedagogy. As such, at the end of this program students will be able to develop, internalise and exercise ethics in their professional as well as personal practices.

PO-8: Environment and Sustainability: 'Environmental sustainability' has become the watchword of the 21st century. An increased engagement with environment related concerns is appearing tangibly on global fronts; academics cannot and should not remain quarantined from this massive development. Through classroom discussions and research projects, this program facilitates active dialogues with factors which influence human-ecology interactions. As such, at the end of this program students will be able to identify and analyze socio-political, cultural and economic problems which act as deterrents to environmental sustainability and provide creative solutions towards the same.

PO-9: Soft-Skill Development: Apart from the attainment of knowledge and hands on skills in practical applicability of the subject, learners need to be equipped with soft-skills and values which will help them function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary groups. These softs kills include leadership, teamwork, project-management, positive outlook, innovative approaches and effective articulation. Several soft skill programs are organized for learners through various agencies that tie up with the state government. As such, at the end of this program, students will be able to hone the soft-skills

required in positively enhancing their academic, professional and personal pursuits towards self and societal advancement.

PO-10: Science and Society: As an outcome of PO-1, PO-2 and PO-3, learners are encouraged to apply logical reasoning based on the knowledge, skills, designing solutions to assess societal, health, safety issues and the responsibilities that go along with the scientific practice. As an extension activity to society, learners are encouraged to take up specific projects such as impact of salinity on fresh water wells in an adopted village, and provide effective solutions.

PO-11: Life-long learning: With the pursuit of knowledge for either personal or professional reasons, learners are also encouraged to volunteer and be self-motivated that not only enhances society values, active participation and personality development, but also enhances self-sustainability, competitiveness and employability. As such, learners will be able to recognize the need for, and have the preparation and ability to engage in independent and life-long learning in every broad context of technological changes.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1. Botany is a scientific study of plant life. It ignites a passion in the students to love an outdoor environment and stimulates their interest in exploring a variety of landscape and terrains to interact with plants.

PSO2. The basic knowledge of Botany will help the students in areas of Agriculture by making them aware of the planting and cultivation techniques to improve efficiency and effectiveness of growing crops.

PSO3. Botany plays a critical role in many areas of life. The scientific study of medicinal plants called Ethnobotany contributes to development of new medicines and treatment of major diseases.

PSO4. Botany also provides employment opportunities for the students in Agriculture, Horticulture, Forestry and Genetic Engineering.

PSO5. The experimental techniques in Botany helps the students to develop a deep sense of curiosity, critical observation, keenness to reach to the root of the problem and discover the truth which is a basic foundation of scientific temper and train them to become future scientists.

Course Structure

S.N.	Program	Paper	Topic
1	B.Sc. 1	I	Fungi, Lichens, Bacteria & Viruses
		II	Algae and Bryophyta
		III	Pteridophyta and Gymnospermophyta
2	B.Sc. II	I	Taxonomy, Morphology & Anatomy, Plant Reproduction
		II	Plant Physiology and Plant Ecology
		III	Cytology And Genetics, Molecular Biology, Evolution
3	B.Sc. III	I	Microbiology and Applied Microbiology, Plant Pathology,
		II	Economic Botany, Applied Plant Anatomy, Marine Biology, Limnology and Plant Breeding
		III	Palaeobotany, Palynology, Plant Diversification, Morphogenesis and Tissue Culture

Course Outcomes (CO):

BSc. Year 1

Course: Fungi, Lichens, Bacteria & Viruses

CO 1: The study of fungi, bacteria and viruses will enable the students to compare and understand the key concepts of the diverse microbial world.

CO 2: Understand the economic importance of algae and significance of lichens in relation to pollution.

CO 3: Students will understand pathogenicity of fungi and host responses, and the importance of fungi as saprobes.

CO 4: Students will understand the role played by bacteria in the colonization of land by higher forms, and comprehend their relevance in the fields of molecular biology and biotechnology, environmental and industrial microbiology.

CO 4: Students will learn how viruses and sub-viral pathogens serve as important model systems in the study of the various phenomena common to life, in addition to the techniques and tools related to the study of plant viruses.

Course: Algae and Bryophyta

CO 1: Recognize the Algal diversity, morphological and reproductive features of various genera, and classification of algae and lichens

CO 2: Understand the economic importance of algae.

CO 3: Recognize the diversity in the gametophytic and sporophytic organization of Liverworts.

CO 4: Knowledge of features, classification and affinities of Bryophytes, and diversity in gametophytic and sporophytic organization of Moss and Hornwort

Course: Pteridophyta and Gymnospermophyta

CO 1: Knowledge of different classes of Pteridophytes along with their stelar details and seed habit

CO 2: Complete insight of the morphological, anatomical and reproductive diversity within the Pteridophytes

CO 3: Knowledge of morphological, anatomical and reproductive diversity within Gymnosperms.

CO 4: Understanding of the economic importance of Gymnosperms.

B.Sc. Year II

Course: Taxonomy, Morphology & Anatomy, Plant Reproduction

CO 1: Knowledge of Angiosperm systematics through classifications, herbaria, botanical gardens and hotspots

CO 2: Complete insight of the taxonomic & phylogenetic diversity and economic importance of representative families

CO 3: Clear concept of meristems, tissues, their growth and differentiation, and development of organs

CO 4: Understanding of the reproductive system in Angiosperms

Course: Plant Physiology and Plant Ecology

CO 1: Knowledge of different aspects of plant water relations, culture methods and mineral nutrients.

CO 2: Complete insight of plant enzymes and various perspectives of photosynthesis.

CO 3: Knowledge about the ecological groups of plants and their adaptations to diverse habitats

CO 4: Gain an insight into the diverse ecosystems and related food webs and ecological pyramids

Course: Cytology and Genetics, Molecular Biology, Evolution

CO 1: Knowledge of structure and function of cell and its organelles

CO 2: Understanding of the chromosome organization and cell division

CO 3: Understanding of the phenomenon of inheritance along with deviations and sex determination

CO 4: Understand the concept of origin of life, and comprehend evolution based on theories and evidences

B.Sc. Year III

Course: Microbiology and Applied Microbiology, Plant Pathology,

CO 1: Gain knowledge on types of microbial culture media, sterilization techniques, measurement of microbial growth and Nutritional types.

CO 2: Understanding of the handling and Standard Operating Procedures of different instruments being used in Microbiology laboratory.

CO 3: Understanding of the method and importance of Sterilization, preparation of media for the growth of microorganisms in the laboratory.

CO 4: Understanding of the Illustrate the disease cycle of bacterial and fungal pathogens of plants.

Course: Economic Botany, Applied Plant Anatomy, Marine Biology, Limnology and Plant Breeding

CO 1: Understanding of the crop diversity and origin, domestication and uses of crop plants, complete insight into economically important plants.

CO 2: Understanding of the internal structure of various parts of a plant and as well as among different plant groups in support for the evolutionary concept.

CO 3: Understanding of the zonation in aquatic ecosystem with their specific flora and fauna.

CO 4: Understanding of the crop plant improvement, employability skills by understanding Mendel's ratios and deviation, linkage and crossing over and the conventional methods of plant breeding.

Course: Palaeobotany, Palynology, Plant Diversification, Morphogenesis and Tissue Culture

CO 1: Gain knowledge on fossils and their types as well as their significance.

CO 2: Understanding to the pollen morpho types and their application.

CO 3: Understanding to the evolution of plants during different geological periods and their origin and extension.

CO 4: Understanding of the tissue culture techniques in micro-propagation of rare and medicinal plants, the alternative techniques for mass propagation