Name of the Programme: B.Sc. BOTANY (FYUGP)

Programme Outcomes (PO)

After completing the Four Year Undergraduate Programme in Botany, Students are expected to achieve the following Programme Outcomes:

PO1 Critical thinking
- Exhibit knowledge of the discipline
- Ability to rationally analyze

PO2 Communication Skills
- Capability to convey the intricate information effectively and efficiently
- Develop soft skills and analyze and engage with their surrounding

PO3 Problem-solving
- Solve the problems related to animal sciences without relying on assumptions and guesswork.

PO4 Analytical reasoning
- Capability of seeking solutions and logically solving them by experimentation and data processing either manually or through software.

PO5 Research-related skills
- Tools and techniques of research
- Methodology of research

PO6 Cooperation/Teamwork
- Ability to recognize and mobilize relevant resources essential for a project.
- Manage the project in a responsible way by following ethical scientific conduct and bio-safety protocols.

PO7 Reflective thinking
- To relate new knowledge to prior understanding and knowledge
- Engage and understanding own's thinking and learning strategies

PO8 Digital literacy/ Use of Modern Tools
- Capable of using computers for biological simulation, computation and appropriate software for biostatistics and bioinformatics

PO9 Environmental Awareness
- Demonstrate awareness on environment and conservation of the environment

PO10 Practical Skills
- Develop practical skills in various fields and help in research work

PO11 Lifelong Learning

● Engage in lifelong learning Work on career enhancement and adapt to changing professional and societal needs

 Capable of self-paced and self-directed learning aimed at personal and social development.

PO12 Botany and society

● Instill professional competencies and values that aid in rapid professional growth and be in positions of responsibility and governance that help serve the betterment of society.

Programme Specific Outcomes (PSO)

The program-specific outcomes of the Undergraduate Programme in Botany are listed below. After completing the program the students will be able to

PSO1 Understand the structure and reproduction of plant forms algae, fungi, bryophytes, pteridophytes, gymnosperms, and angiosperms

PSO2 Understand basic concepts in the methodology of science, plant systematics, ecology, anatomy, cell biology, physiology, molecular biology, genetics, plant breeding, biotechnology and bioinformatics

PSO3 Experiment with essential laboratory practicals in anatomy, cytology, microtechnique, physiology, taxonomy, morphology, biochemistry, and biophysics.

Course Outcomes (CO)

B.Sc. 1st Semester

Paper code **BOTC1**

Paper title Algae, Fungi, Bryophyte and Pteridophyte

Outcomes of this course are listed below:

CO1 After completing this course, the students will be able to know the morphology and reproduction of cryptogams that is algae, fungi, bryophytes, and pteridophytes.

CO2 The students will know the economic and ecological importance of cryptogams.

CO3 They will know about different classification systems of cryptogams.

CO4 They will know about the evolutionary trends of bryophytes along with the evolution of stele in Pteridophytes.

CO5 The students will be able to handle and observe the morphological and reproductive structures of different cryptogams which are provided in their course.

Paper code	**MINBOT1**
Paper title	Algae, Fungi, Bryophyte and Pteridophyte
	Outcomes of this course are listed below:
CO1	The students will be able to know the morphology and reproduction of cryptogams that is algae, fungi, bryophytes, and pteridophytes.
CO2	The students will know the economic and ecological importance of cryptogams.
CO3	They will know about different classification systems of cryptogams.
CO4	They will know about the evolutionary trends of bryophytes along with the evolution of stele in Pteridophytes.
CO5	The students will be able to handle and observe the morphological and reproductive structures of different cryptogams which are provided in their course.

Paper code	**GECBOT1**
Paper title	Natural Resource Management
CO1	After completing this course, the students will be able to learn about natural resources and their types.
CO2	They will be able to know the sustainable utilization and management practices of natural resources.
CO3	The students will be able to learn about Ecological footprint and Resource accounting.
CO4	They will know about different waste management practices.
CO5	The students will be able to know various national and international efforts in resource management and conservation.

B.Sc. 2nd Semester

Paper code	**BOTC2**
Paper title	Morphology and Reproduction of Spermatophytes
CO1	The students will be able to know on characteristics and reproduction of different groups of gymnosperms & the economic importance
CO2	The students will be able to Understand the structure and development of microsporangium and megasporangium.
CO3	The students will be able to Understand the process of microsporogenesis and megasporogenesis.
CO4	The students will be able to To understand the process of pollination and fertilization, endosperm, and embryogeny.
CO5	The students will be able to differentiate different types of pollen and ovules through practical.

Paper code	**MINBOT2**
Paper title	**Morphology and Reproduction of Spermatophytes**
CO1	The students will be able to know on characteristics and reproduction of different groups of gymnosperms & the economic importance
CO2	The students will be able to understand the structure and development of microsporangium and megasporangium.
CO3	The students will be able to understand the process of microsporogenesis and megasporogenesis.
CO4	The students will be able to understand the process of pollination and fertilization, endosperm, and embryogeny.
CO5	The students will be able to differentiate different types of pollen and ovules through practical

Paper code	**GECBOT2**
Paper title	Plant Diversity and Human Welfare
CO1	The students will be able to know the diversity of plant resources, their importance, and strategies for conservation.
CO2	The students will be able to understand the scientific approach to address problems in plant science
CO3	The students will be able to know the scope, dimension and importance, and threats to plant diversity
CO4	The students will be able to understand Conservation ways of biodiversity and its Sustainable utilization.
CO5	The students will be able to understand the use of plant-based products for human welfare.

B.Sc. 3rd Semester

Paper code	BOTC3
Paper title	**Cell Biology**
CO1	The students will be able to able to understand cell division and regulation
CO2	The students will be able to provide knowledge on cellular composition
CO3	The students will be able to apply the concepts of cell biology to understand the basic processes in life
CO4	The students will be able to have developed a very good understanding of the different practicals related to cell biology
CO5	The students will be able to have knowledge on membrane transport and Protein sorting & Targeting

Paper code	**BOTC4**
Paper title	**Plant Biochemistry and Molecular Biology**
	After completing this course, the students will be able
CO1	The students will be able to gain an understanding of the chemical nature of biological macromolecules
CO2	The students will be able to understand the process of replication, transcription, and translation
CO3	The students will learn about the post-transcriptional and translational modification
CO4	The students will be able to apply the knowledge of the process of central dogma
CO5	The students will be able to enhance the critical thinking of students about molecular biology

Paper code	**MINBOT3**
Paper title	**Plant Physiology and Metabolism**
	After completing this course, the students will be able
CO1	To understand the conduction path of water and mineral nutrients
CO2	To know about the functions of various phytohormones
CO3	To expose the students to various metabolic processes involved with plant life
CO4	Understand and relate the various light and dark reaction cycles
CO5	To calculate and determine the osmotic potential, stomatal index and rate of transpiration through practical

Paper code	**GECBOT3**
Paper title	**Plant Physiology and Metabolism**
	After completing this course, the students will be able
CO1	To understand the conduction path of water and mineral nutrients
CO2	To know about the functions of various phytohormones
CO3	To expose the students to various metabolic processes involved with plant life
CO4	To understand and relate the various light and dark reaction cycles
CO5	To calculate and determine the osmotic potential, stomatal index, and rate of transpiration through practical

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