

**SREE KRISHNA COLLEGE, GURUVAYUR  
PG & RESEARCH DEPARTMENT OF BOTANY**

**PROGRAMME OUTCOME, PROGRAMME SPECIFIC OUTCOME AND COURSE  
OUTCOME**

**B.Sc. Botany:**

The curriculum of the undergraduate programme in Botany, is designed to achieve the overall scholastic improvement of the students on various aspects of plant science. The scheme emphasises on developing systematic reasoning and critical analysis of the theories and facts. It ensures in-depth knowledge in the fundamentals of the subject and gives equal importance for the generalized and specialized area in each course. The expected outcomes are;

- Understand the scope and importance of Botany.
- Develop genuine interest in nature and its components.
- Develop scientific temperament and reason skills
- To emphasise the significance of natural resources and sustainable development.
- To develop skill and opportunities in various methods like vegetative propagation, Mushroom cultivation, composting etc.

<b>Name of the Programme</b>	<b>B.Sc. Botany</b>
<b>Programme Outcome</b>	<ol style="list-style-type: none"> <li>1. Critical Thinking</li> <li>2. Problem Solving</li> <li>3. Effective Communication</li> <li>4. Effective Citizenship</li> <li>5. Environment and Sustainability</li> </ol>
<b>Programme Specific Outcome</b>	<ol style="list-style-type: none"> <li>1. Scope and importance of Botany: Understand scope and importance of Botany in every field especially in dealing with societal and environmental issues, agriculture, ethics and healthcare.</li> <li>2. Environmental concern: Understand the and the role of plants in sustaining life on earth and the interrelationship between human beings and nature, create awareness on natural resources and their importance in sustainable development, analyze the importance of biodiversity conservation, estimate biodiversity loss and develop conservation strategies.</li> <li>3. Scientific temper: Develop scientific temper and undertake scientific projects.</li> <li>4. Practical applications: Identify and classify plants according to the principles of plant systematics, apply techniques like plant propagation methods, organic farming, mushroom cultivation, preparation of biofertilizers, biopesticides etc. in daily life.</li> </ol>

	5. Awareness on life processes: Understand plant life processes, biomolecules, basic hereditary and evolutionary principles.
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**Course outcomes: B.Sc. Core**

Semester	Course Code	Course Name	Credit	Course outcome
I	BOT1B01T	Angiosperm Anatomy, Reprod. Botany & Palynology	3	<ol style="list-style-type: none"> <li>1. Demonstrate the ability to differentiate plant organs by observing anatomical features.</li> <li>2. Understand the non-living inclusions of plants and their significance.</li> <li>3. Differentiate tissues and their functions.</li> <li>4. Illustrate primary and secondary (normal and anomalous) structures of plant organs.</li> <li>5. Explain various developmental details of angiosperms.</li> <li>6. Realize the significance and applications of palynology.</li> </ol>
II	BOT2BO2T	Microbiology, Mycology, Lichen. & Plant Pathology	3	<ol style="list-style-type: none"> <li>1. Understand basics of microbial life and their economic importance.</li> <li>2. Develop general awareness on the diversity of microorganisms, fungi and lichens.</li> <li>3. Analyze the ecological role played by bacteria, fungi and lichens</li> <li>4. Identify plant diseases and find out control measures.</li> <li>5. Realize the significance of plant diseases as far as crop production is concerned.</li> </ol>
III	BOT3BO3T	Phycology, Bryology & Pteridology	3	<ol style="list-style-type: none"> <li>1. Appreciate the diversity and evolutionary significance of lower plant groups.</li> <li>2. Classify algae, bryophytes and pteridophytes.</li> <li>3. Understand the economic and ecological importance of lower plant groups</li> </ol>

IV	BOT4BO4T	Methodology and Perspectives in Plant Science	3	<ol style="list-style-type: none"> <li>1. Develop scientific temper and problem-solving skills.</li> <li>2. Undertake scientific projects and prepare project reports</li> <li>3. Summarize, organize and display quantitative data and derive conclusions</li> <li>4. Prepare permanent slides, applying the histochemical techniques</li> </ol>
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Semester	Course Code	Course Name	Credit	Course outcome
V	BOT5BO6T	Gymnosperms, palaeobotany, phytogeography and evolution	3	<ol style="list-style-type: none"> <li>1. Understand the role of gymnosperms as a connecting link between pteridophytes and angiosperms.</li> <li>2. Appreciate the process of organic evolution.</li> <li>3. Realize the importance of fossil study.</li> <li>4. Understand the climatic conditions of the past and realize the changes happened</li> <li>5. Recognize the phytogeographic zones of India.</li> </ol>
	BOT5BO7T	Angiosperms Morphology & Systematics	3	<ol style="list-style-type: none"> <li>1. Appreciate the diverse morphology of angiosperms.</li> <li>2. Identify and classify plants based on taxonomic principles.</li> <li>3. Make scientific illustrations of vegetative and reproductive structures of plants.</li> <li>4. Develop the skill of scientific imaging of plants.</li> <li>5. Realize the importance of field study.</li> <li>6. Change their attitude towards over exploitation of rare/endemic plants.</li> </ol>
	BOT5BO8T	Tissue culture, Horticulture, Economic Botany & Ethnobotany	3	<ol style="list-style-type: none"> <li>1. Critically evaluate the advantages of tissue culture and horticulture over conventional methods of propagation.</li> <li>2. Apply various horticultural practices in the field.</li> </ol>

				3.Experiment on the subject and try to become entrepreneurs. 4. Identify the economically important plants.
	BOT5B09T	Cell Biology & Biochemistry	3	1.Appreciate the ultra-structure of a plant cell. 2. Enumerate the functions of each cell organelle. 3. Draw and explain the structure of biomolecules.
VI	BOT6B10T	Genetics & Plant Breeding	3	1.Appreciate the facts behind heredity inheritance and variations 2. Predict the pattern of inheritance. 3. Understand various plant breeding techniques and its role in increasing crop productivity.
	BOT6B11T	Biotechnology, Molecular Biology & Bioinformatics	3	1.Analyze the role of biotechnology in daily life. 2 Understand the basic aspects of bioinformatics. 3 Explain the concepts in molecular biology.
	BOT6B12T	Plant Physiology & Metabolism	3	1.Explain the metabolic processes taking place in each cell. 2.Identify the physiological responses of plants. 3. Analyze the role of external factors in controlling the physiology of plants. 4. Appreciate the energy fixing and energy releasing processes taking place in cells.
	BOT6B13T	Environmental Science	3	1.Realize the importance of ecological studies. 2.Practise Reduce, Reuse and Recycle. Spread awareness of the need of conservation of biodiversity and natural resources. 3. Analyze the reasons for climate change and find out ways to combat it.
	BOT6B14T (E3)	Elective- Choice - III Genetics and Crop Improvement	3	1.Understand various techniques employed for increasing crop productivity. 2.Identify diseases affecting crop

				plants. 3. Attain general awareness on various crop research stations of the country.
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### Course Outcome: Open course

Semester	Course Code	Course Name	Credit	Course outcome
5	BOT5 DO2	APPLIED BOTANY	2	1. Attain a general overview on the various applied aspects of Botany. 2. Study the role of plants in everyday life. 3. Apply vegetative propagation methods in everyday life. 4. Understand the economic importance of plants.

### B.Sc. Core Course outcomes:

1. **Scope and importance of Botany:** Understand scope and importance of Botany in every field especially in dealing with societal and environmental issues, agriculture, ethics and healthcare.
2. **Environmental concern:** Understand the role of plants in sustaining life on earth and the interrelationship between human beings and nature, create awareness on natural resources and their importance in sustainable development, analyze the importance of biodiversity conservation, estimate biodiversity loss and develop conservation strategies.
3. **Scientific temper:** Develop scientific temper and undertake scientific projects.
4. **Practical applications:** Identify and classify plants according to the principles of Plant systematic, apply techniques like plant propagation methods, organic farming, mushroom cultivation, preparation of biofertilizers, biopesticides etc, in daily life.
5. **Aware on life processes:** Understand plant life processes, biomolecules, basic hereditary and evolutionary principles.

### Course outcome: Complementary Course:

Semester	Course Code	Course Name	Credit	Course outcome
I	BOT1C01T	Angiosperm Anatomy & Microtechnique	2	Explain different tissue systems, secondary tissues, normal and anomalous growth in plants.
II	BOT2C02T	Cryptogams, Gymnosperms & Plant Pathology	2	Explain about lower group of plants and their ecological significance.
III	BOT3C03T	Morphology, Systematic Botany, Economic Botany, Plant Breeding & Horticulture	2	Study about the reproductive structures of angiosperms. Study about concepts of Plant breeding and various horticultural practices.
IV	BOT4C04T	Plant Physiology, Ecology & Genetics	2	To understand the basic principles of Plant physiology and genetics.

### M.Sc Botany:

The Post graduate programme in Botany covers the significance of various domains of Plants science as well as Life science in general. It aims to equip the students with the most updated principles and also inculcate the capacity of scientific thinking, analysis and application. The curriculum understands and is designed with different areas of scope that can be utilised by the students, in academic or industrial levels. Through the four semesters students are exposed to the fundamentals and are gradually led to the applied levels of various domains. The expected outcomes are:

- Understand the phylogeny of the different plant groups and their interrelations.
- Procure a scientific base on various aspects of cellular and molecular Biology.
- Understand and apply the principles of Plant systematics in both conventional as well as modern techniques.
- Specialise in various aspects of Plant Breeding and Crop improvement methods.
- Expertise in Plant pathology emphasising on various crop plants.

Name of the Programme	<b>M.Sc. Botany</b>
Programme Outcome	<ol style="list-style-type: none"> <li>1. Creative Thinking</li> <li>2. Problem Solving</li> <li>3. understanding the basic concepts of life</li> <li>4. Environment and Sustainability</li> </ol>
Programme Specific Outcome	<ol style="list-style-type: none"> <li>1.To develop a practical knowledge on bioprocess.</li> <li>2. Environmental sustainability</li> <li>3. Scientific temper</li> <li>4. Awareness on life processes: Understand plant life processes, biomolecules, basic hereditary and evolutionary principles.</li> </ol>

### Course Outcome

Semester	Course Code	Course Name	Credit	Course outcome
I	BOT1CO1	Phycology, Bryology, Pteridology and Gymnosperms	5	<ol style="list-style-type: none"> <li>1.Appreciate the diversity and evolutionary significance of lower plant groups.</li> <li>2.Classify algae, bryophytes and pteridophytes.</li> <li>3.Understand the economic and ecological importance of lower plant groups</li> <li>4. Understand the role of gymnosperms as a connecting link between pteridophytes and angiosperms.</li> <li>5.Appreciate the process of organic evolution.</li> <li>6. Realize the importance of fossil study.</li> </ol>
I	BOT1CO2	Mycology and Lichenology, Microbiology and Plant Pathology	5	<ol style="list-style-type: none"> <li>1. Understand the diversity of microorganisms, fungi and lichens.</li> <li>2. To study the practical application and significance of bacteria, fungi and lichens</li> <li>3.classification and identification of lower groups.</li> <li>4.Appreciate the diversity and evolutionary significance of lower plant groups.</li> <li>5.Understand the economic and ecological importance of lower plant</li> </ol>

				groups. 6. Identify plant diseases and find out control measures. 7. Practical sessions for theory visualization.
I	BOT1CO3	Angiosperm Anatomy, Angiosperm Embryology, Palynology and Lab Techniques	5	1. To Understand the internal structures and significance. 2. Explain various developmental details of angiosperms. 3. Realize the significance and applications of palynology. 4. Practical sessions for theory visualization
II	BOT2CO4	Cell Biology, Molecular Biology and Biophysics	5	1. To study the cell organ and molecular concepts and its function 2. Practical sessions for theory visualization.
II	BOT2CO5	Cytogenetics, Genetics, Biostatistics, Plant Breeding and Evolution	5	1. To understand the facts behind heredity inheritance and variations 2. Understand various plant breeding techniques and its role in increasing crop productivity. 3. Practical sessions for theory visualization
II	BOT2CO6	Plant Ecology, Conservation Biology, Phytogeography and Forest Botany	5	1. To realise the ecological spot and plant community 2. Plant conservation status, distribution 3. Plant product and its benefits. 4. Practical sessions for theory visualization
III	BOT3C07	Plant Physiology, Metabolism and Biochemistry	5	1. Explain the metabolic processes taking place in each cell. 2. To understand the thermodynamic principles and molecular logic of Life. 3. Explain the physiological and developmental phenomenon in plants. 4. To understand the metabolic reactions and their regulations in living cells. 5. Students also gain skill in handling qualitative and quantitative experiments.



III	BOT3CO8	Angiosperm Morphology, Angiosperm Taxonomy and Plant Resources	5	<p>1.Appreciate the diverse morphology of angiosperms.</p> <p>2.Identify and classify plants based on taxonomic principles.</p> <p>3. Make scientific illustrations of vegetative and reproductive structures of plants.</p> <p>4. Develop the skill of scientific imaging of plants.</p> <p>5. Realize the importance of field study.</p> <p>6. Change their attitude towards over exploitation of rare/endemic plants.</p> <p>7. Practical sessions for theory visualization.</p>
III	BOT3CO8	Biotechnology and Bioinformatics	5	<p>1.Apply various biotechnological techniques.</p> <p>2.To explain the various sequences and barcoding.</p> <p>3. Practical sessions for theory visualization</p>
IV	BOT4E01	6. Genetics and Crop Improvement	5	<p>Emphasises on the significance of reproduction and mating systems of crop plants.</p> <p>To understand the significance of crop genetic resources and centres of origin and its application in crop improvement programmes.</p> <p>A detailed study on the conventional and modern breeding methods in crop plants and the role of key institutions like ICAR, IARI etc.</p> <p>To understand the genetics of key phenomenon like Photosynthesis and Nitrogen fixation and its application in crop science.</p>
IV	BOT4E02	2. Pathology of Plantation Crops and Spices.	5	<p>1.To understand the mechanisms and reasons behind diseases in major agricultural crops and thereby bring</p>

				<p>about modifications in cultural practices to reduce disease incidence and increase the crop yield.</p> <p>2. With the knowledge of mode of disease spread, many diseases of crops of economic importance can be checked, minimized or controlled.</p> <p>3. Crop improvement and varietal resistance can be achieved against many diseases.</p> <p>4. To understand and solve the problems of relevance about the diseases in agricultural crops, to society, to meet the specified needs, using the knowledge, skills and attitudes acquired by learning pathology of crops.</p>
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