

## DEPARTMENT OF BOTANY

### Programme Specific Outcomes (PSOs) – B. Sc Botany Programme

	Programme specific outcomes
PSO1	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.
PSO2	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.
PSO3	Scientific temper: Develop scientific temper and undertake scientific projects.
PSO4	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.
PSO5	Awareness on life processes: Understand plant life processes, biomolecules, basic hereditary and evolutionary principles.

### Course Outcomes

Semester	Course Code	Course Name	Course outcomes
I	BOT1C01T	Angiosperm Anatomy And Microtechnique	<ul style="list-style-type: none"> <li>• CO1: Explain the types, structure and functions of plant tissues..</li> </ul>
			<ul style="list-style-type: none"> <li>• CO2: Understand the non-living inclusions of plants and their significance.</li> </ul>
			<ul style="list-style-type: none"> <li>• CO3: Differentiate tissues and their functions.</li> </ul>
			<ul style="list-style-type: none"> <li>• CO4: Illustrate primary and secondary (normal and anomalous) structures of plant organs</li> </ul>
			<ul style="list-style-type: none"> <li>• CO5: Explain various developmental details of angiosperms.</li> </ul>

			<ul style="list-style-type: none"> <li>• CO6: Realize the significance and applications of palynology.</li> <li>• CO7: Prepare permanent slides, applying the histochemical techniques</li> </ul>
II	BOT2B02T	Microbiology, Mycology, Lichenology And Plant Pathology	<ul style="list-style-type: none"> <li>• CO1: Understand basics of microbial life and their economic importance.</li> <li>• CO2: Develop general awareness on the diversity of microorganisms, fungi and lichens.</li> <li>• CO3: Analyze the ecological role played by bacteria, fungi and lichens</li> <li>• CO4: Identify plant diseases and find out control measures</li> <li>• CO5: Realize the significance of plant diseases as far as crop production is concerned.</li> </ul>
III	BOT3B03T	Phycology, Bryology And Pteridology	<ul style="list-style-type: none"> <li>• CO1: Appreciate the diversity and evolutionary significance of lower plant groups</li> <li>• CO2: Classify algae, bryophytes and pteridophytes.</li> <li>• CO3: Understand the economic and ecological importance of lower plant groups.</li> </ul>
IV	BOT4B04T	Methodology And Perspectives In Plant Science	<ul style="list-style-type: none"> <li>• CO1: Develop scientific temper and problem solving skills.</li> <li>• CO2: Undertake scientific projects and prepare project reports</li> <li>• CO3: Summarize, organize and display quantitative data and derive conclusions</li> </ul>
IV	BOT4B05P	Core Course Practical Paper - I	<ul style="list-style-type: none"> <li>• CO1: Identification at sight the different types of tissues and vascular bundles. Secondary structures: Dicot stem Anomalous secondary thickening in Boerhaavia, Bignonia and Dracaena Types of ovules: Orthotropous, Anatropous and</li> </ul>

			<p>Campylotropous Dicot and monocot embryo of Angiosperms Pollen morphology Viability test for pollen.</p>
			<ul style="list-style-type: none"> <li>• CO2: Simple staining ,Gram staining –Culture and isolation of bacteria using nutrient agar medium</li> </ul> <p>Micropreparation – Lactophenol cotton blue – Slides of the above mentioned types Identification of different forms of Lichens. Usnea : structure of thallus, fruiting body</p> <p>Identification of the disease, pathogen, symptoms and control measures of the following:</p> <ol style="list-style-type: none"> <li>a. Citrus canker</li> <li>b. Mahali disease</li> <li>c. Tapioca mosaic disease</li> <li>d. Blast of Paddy</li> <li>e. Quick wilt of pepper</li> <li>f. Bunchy top of banana</li> <li>g. Grey leaf spot of coconut</li> </ol>
			<ul style="list-style-type: none"> <li>• CO3 Identification of the vegetative and reproductive structures of the algal types studied.</li> </ul> <p>Study of Habit, Anatomy of thallus and reproductive structures of Riccia, Anthoceros and Bryum Study of habit, T.S. of stem, C.S. of synangium of Psilotum, Selaginella Equifsetum and Pteris</p>
			<ul style="list-style-type: none"> <li>• CO4: Work out problems under all types mentioned in the syllabus.</li> </ul> <p>Familiarize the technique of data</p>

			<p>representation.</p> <p>Preparation of solutions of known concentrations using pure samples and stock solutions.</p> <p>Preparation of buffers</p> <p>Measurement of pH using pH meter.</p> <p>Demonstration of the working of different kinds of centrifuges</p> <p>Parts of microscope and its operation .</p> <p>Free hand sectioning of stem, leaves, Staining and mounting.</p> <p>Measurement of pollen size using micrometer.</p> <p>Demonstration of dehydration, infiltration, embedding and microtoming.</p>
V	BOT5B06T	Gymnosperms, Palaeobotany, Phytogeography And Evolution	<ul style="list-style-type: none"> <li>• CO1:Understand the role of gymnosperms as a connecting link between pteridophytes and angiosperms</li> </ul>
			<ul style="list-style-type: none"> <li>• CO2:Appreciate the process of organic evolution.</li> </ul>
			<ul style="list-style-type: none"> <li>• CO3: Realize the importance of fossil study.</li> </ul>
			<ul style="list-style-type: none"> <li>• CO4:Recognize the phytogeographic zones of India.</li> </ul>
V	BOT5B07T	Angiosperm Morphology And Systematics	<ul style="list-style-type: none"> <li>• CO1:Appreciate the diverse morphology of angiosperms.</li> </ul>
			<ul style="list-style-type: none"> <li>• CO2: Identify and classify plants based on taxonomic principles.</li> </ul>
			<ul style="list-style-type: none"> <li>• CO3:Make scientific illustrations of vegetative and reproductive structures of plants</li> </ul>
			<ul style="list-style-type: none"> <li>• CO4:Develop the skill of scientific imaging of plants.</li> </ul>
			<ul style="list-style-type: none"> <li>• CO5: Realize the importance of field study</li> </ul>
			<ul style="list-style-type: none"> <li>• CO6:Change their attitude towards over exploitation of rare/endemic plants.</li> </ul>

V	BOT5B08T	Tissue Culture, Horticulture, Economic Botany And Ethnobotany	<ul style="list-style-type: none"> <li>• CO1: Critically evaluate the advantages of tissue culture and horticulture over conventional methods of propagation.</li> </ul>
			<ul style="list-style-type: none"> <li>• CO2: Apply various horticultural practices in the field.</li> </ul>
			<ul style="list-style-type: none"> <li>• CO3: Experiment on the subject and try to become entrepreneurs.</li> </ul>
			<ul style="list-style-type: none"> <li>• CO4: Identify the economically important plants</li> </ul>
V	BOT5B09T	Cell Biology And Biochemistry	<ul style="list-style-type: none"> <li>• CO1: Appreciate the ultra-structure of a plant cell</li> </ul>
			<ul style="list-style-type: none"> <li>• CO2: Enumerate the functions of each cell organelle</li> </ul>
			<ul style="list-style-type: none"> <li>• CO3: Draw and explain the structure of biomolecules.</li> </ul>
V	BOT6B15P	Core Course 15: Practical Paper- II:	<ul style="list-style-type: none"> <li>• CO1: Details study Cycas- Habit, coralloid root, T.S. of coralloid root, T.S. of leaflet, T.S. of rachis, male cone and L.S. of male cone , microsporophyll, megasporophyll T.S. of microsporophyll, L.S. of ovule and seed. 2. Pinus- branch of unlimited growth, spur shoot, T.S. of stem and needle, male cone and female cone, L.S. of male cone and female cone, seed. 3. Gnetum- Habit, stem T.S., leaf T.S., male and female cones, L.S. of ovule, seed. Study of Fossil Pteridophytes - Rhynia stem, Lepidodendron and Calamites 2 Fossil gymnosperms- Williamsonia practical knowledge on the phytogeographic zones of India.</li> </ul>
			<ul style="list-style-type: none"> <li>• CO2: Identify the types of inflorescence and fruits mentioned in the syllabus. Identification of plants, drawing floral diagram, floral formula, herbarium preparation techniques</li> </ul>

			<ul style="list-style-type: none"> <li>• CO3: Preparation of nutrient medium – Murashige and Skoog medium using stock solutions.</li> <li>2. Familiarize the technique of preparation of explants, surface sterilization, inoculation and subculturing.</li> <li>3. Preparation of synthetic seeds.</li> <li>4. Demonstration of anther culture.</li> <li>5. Preparation of nursery bed and polybag filling.</li> <li>6. Preparation of potting mixture – Potting, repotting.</li> <li>7. Field work in cutting, grafting, budding, layering (drawing not required).</li> <li>8. Familiarizing gardening tools and implements.</li> <li>9. Establishment of vegetable garden</li> </ul> <p>Students shall be able to identify plants or plant products (raw or processed) and shall be able to write Botanical names, Family and morphology of useful parts of source plants</p> <p>Students are expected to identify the plants mentioned in the Ethnobotany syllabus</p>
			<ul style="list-style-type: none"> <li>• CO4: Mitosis - Acetocarmine squash preparation of Onion root tip.</li> <li>2. Calculation of mitotic index</li> <li>3. Demonstration of meiosis in Rhoeo/ Chlorophytum/ Maize and identification of different stages of Meiosis.</li> </ul> <p>Qualitative tests for monosaccharides, and reducing non reducing oligosaccharides, starch, amino acids and protein</p> <p>Quantitative estimation of</p>

			<p>protein by Biuret method Quantitative estimation of DNA and RNA by colorimetric/spectrophotometric method</p> <p>Colorimetric estimation of reducing sugars in germinating seeds</p>
V	BOT5D03T	Basic Tissue Culture	<ul style="list-style-type: none"> <li>• CO1: Understand plant tissue culture as a rapid propagation method.</li> </ul>
			<ul style="list-style-type: none"> <li>• CO2: Explain the steps involved in tissue culture.</li> </ul>
			<ul style="list-style-type: none"> <li>• CO3: Realize the applications of plant tissue culture</li> </ul>
VI	BOT6B10T	Genetics And Plant Breeding	<ul style="list-style-type: none"> <li>• CO1: Appreciate the facts behind heredity and variations.</li> </ul>
			<ul style="list-style-type: none"> <li>• CO2: Understand the basic principles of inheritance.</li> </ul>
			<ul style="list-style-type: none"> <li>• CO3: Solve problems related to classical genetics.</li> </ul>
			<ul style="list-style-type: none"> <li>• CO4: Predict the pattern of inheritance</li> </ul>
			<ul style="list-style-type: none"> <li>• CO5: Understand various plant breeding techniques</li> </ul>
VI	BOT6 B11T	Biotechnology, Molecular Biology And Bioinformatics	<ul style="list-style-type: none"> <li>• CO1: Analyze the role of biotechnology in daily life.</li> </ul>
			<ul style="list-style-type: none"> <li>• CO2: Understand the basic aspects of bioinformatics.</li> </ul>
			<ul style="list-style-type: none"> <li>• CO3: Explain the concepts in molecular biology.</li> </ul>
VI	BOT6B12T	Plant Physiology And Metabolism	<ul style="list-style-type: none"> <li>• CO1: Identify the physiological responses of plants.</li> </ul>
			<ul style="list-style-type: none"> <li>• CO2: Analyze the role of external factors in controlling the physiology of plants.</li> </ul>
			<ul style="list-style-type: none"> <li>• CO3: Explain the metabolic processes taking place in each cell.</li> </ul>
			<ul style="list-style-type: none"> <li>• CO4: Appreciate the energy fixing and energy releasing processes taking place in cells.</li> </ul>

VI	BOT6B13T	Environmental Science	<ul style="list-style-type: none"> <li>• CO1:Realize the importance of ecological studies.</li> </ul>
			<ul style="list-style-type: none"> <li>• CO2:Develop environmental concern in all their actions and practise Reduce, Reuse and Recycle.</li> </ul>
			<ul style="list-style-type: none"> <li>• CO3:Try to reduce pollution and environmental hazards and change their attitude towards throwing away plastic wastes</li> </ul>
			<ul style="list-style-type: none"> <li>• CO4:Spread awareness of the need of conservation of biodiversity and natural resources.</li> </ul>
			<ul style="list-style-type: none"> <li>• CO5:Analyze the reasons for climate change and find out ways to combat it.</li> </ul>
VI	BOT6 B14T (E3)	Genetics And Crop Improvement	<ul style="list-style-type: none"> <li>• CO1:Understand various techniques employed for increasing crop productivity</li> </ul>
			<ul style="list-style-type: none"> <li>• CO2: Identify diseases affecting crop plants</li> </ul>
			<ul style="list-style-type: none"> <li>• CO3:Attain general awareness on various crop research stations of the country.</li> </ul>
	BOT6B16P	Genetics, Pl. Breeding, Biotechnology, Molecular Biology, Plant Physiology & Environmental Science Practical III	<ul style="list-style-type: none"> <li>• CO1: work out problems related to the theory syllabus-  a. Monohybrid cross  b. Dihybrid cross  c. Test cross and back cross  d. Determination of genotypic and phenotypic ratios and genotype of parents  e. Non epistasis  f. Complementary gene interaction  g. Epistasis: dominant and recessive  h. Polygenic interaction  i. Multiple allelism  j. Chromosome mapping  k. Calculation of Coincidence and interference  Techniques of emasculation and hybridization of any bisexual flower.</li> </ul>



			<p>2. Floral biology of Paddy, any one Pulse and Coconut tree.</p>
			<ul style="list-style-type: none"> <li>• CO2: Extraction of DNA from plant tissue. <ul style="list-style-type: none"> <li>2. Study of genetic engineering tools and techniques using photographs/diagram (Southern blotting, DNA finger printing, PCR).</li> </ul> </li> </ul> <p>Familiarizing with the different data bases mentioned in the syllabus.</p> <ul style="list-style-type: none"> <li>2. Molecular visualization using Rasmol.</li> <li>3. Blast search of nucleotide sequences.</li> </ul>
			<ul style="list-style-type: none"> <li>• CO3: Students shFruit ripening/Rooting from cuttings <ul style="list-style-type: none"> <li>2. Relation between water absorption and transpiration.</li> <li>3. Separation of leaf pigments by paper chromatography/ column chromatography /TLC.</li> <li>4. Effects of light intensity on photosynthesis by Wilmot's bubbler.</li> <li>5. Thistle funnel osmoscope</li> <li>6. Ganong's Potometer</li> <li>7. Ganong's light-screen</li> <li>8. Ganong's respirometer</li> <li>9. Kuhne's fermentation vessel</li> <li>10. Mohl's half-leaf experiment</li> <li>11. Absorbotranspirometer</li> <li>12. Demonstration of gravitropism using Klinostat</li> </ul> </li> </ul> <p>ould familiarize experiments</p>

			<ul style="list-style-type: none"> <li>• CO4: Construct a food web from the given set of data,</li> <li>2. Construct ecological pyramids of number, biomass and energy from the given set of data</li> <li>3. Study of plant communities: Determination of density, abundance, dominance, frequency by quadrat method.</li> <li>4. Demonstration of determination of Dissolved Oxygen by Winkler's method.</li> <li>5. Study of morphological and anatomical characteristics of plant groups: Hydrophytes, Xerophytes, halophytes, epiphytes, parasites.</li> </ul>
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