

Practical Plan

Name of the college: Government College of Arts, Science & Commerce, Sanquelim-Goa		
Name of Faculty: Sukhada A. Borker	Subject: Botany (Major)	
Paper code: BOT-101	Program: F. Y. B.Sc.	Batch: II
Academic year: 2026 – 2027	Semester: I	Total Practicals/Labs: 30 hours
Credits: 01		
Course Objectives: This course aims to: 1. Provide a fundamental understanding of plant diversity, evolution, classification and life processes. 2. Develop knowledge of morphology, anatomy, tissues, and physiological responses of flowering plants. 3. Introduce modern advancements in plant science, including AI, remote sensing, GIS, biofortification, synthetic biology, and biofuels. 4. Impart practical skills in plant identification, observation, experimentation and analysis through laboratory experiments, field visits and hands-on training with scientific instruments and digital tools, fostering scientific inquiry and environmental awareness.		
Expected Course Outcome: On completion of this course, students will be able to: CO1: Recall the diversity of plant life, basic biological processes, plant structures, adaptive responses, modern botanical advancements and laboratory tools. CO2: Explain evolutionary trends, structural organization, functional activities of plants, technological interventions in agriculture, and principles of scientific instruments. CO3: Apply concepts of plant biology and emerging technologies to interpret observations, solve basic botanical problems and perform laboratory-based tasks. CO4: Analyze and evaluate plant systems and technological innovations to address issues related to sustainability, food security and future developments in plant science.		

Student Learning Outcome: By the end of the course, students will be able to:

1. Identify and classify the major groups of the plant kingdom based on their distinguishing characteristics and evolutionary relationships.
2. Describe the morphology, anatomy, tissues, reproductive structures, and life processes of flowering plants using appropriate botanical terminology.
3. Explain fundamental physiological processes such as osmosis, diffusion, imbibition, transpiration, photosynthesis, and respiration, and their significance in plant life.
4. Recognize and interpret different types of roots, stems, leaves, inflorescences, flowers, fruits, seeds, plant tissues, and plant responses through laboratory observations and field studies.
5. Demonstrate practical skills in plant identification, specimen observation, laboratory experiments, and the use of basic botanical instruments and digital tools such as Google Lens and agricultural applications.
6. Apply modern concepts including artificial intelligence, remote sensing, GIS, biofortification, synthetic biology, and biofuels to understand contemporary developments in plant science.
7. Analyze the role of plants in biodiversity conservation, food security, sustainable agriculture, and environmental management.
8. Develop scientific inquiry, observation, analytical thinking, and problem-solving skills through laboratory work, field visits, and hands-on learning experiences.

Month	Practicals/Labs Scheduled Date	No. of Practicals / Labs planned	List of Experiments	Reference books
July	04/07/2026	1	2. Study of different types of stems and root. (2 hours)	Singh, G. (2021). <i>Plant Systematics: Theory and Practice</i> . 3rd Edition. CRC Press, Boca Raton, Florida, USA.
	11/07/2026	1	3. Study of different characters of leaves with respect to types, phyllotaxy, shape, apex, margin and venation. (2 hours)	Singh, G. (2021). <i>Plant Systematics: Theory and Practice</i> . 3rd Edition. CRC Press, Boca Raton, Florida, USA.
	08/07/2026	1	4. Study of whorls of a flower, types of inflorescence and fruits. (2 hours)	Singh, G. (2021). <i>Plant Systematics: Theory and Practice</i> . 3rd Edition. CRC Press, Boca Raton, Florida, USA.
	25/07/2026	1	5. a. Demonstration of epigeal and hypogeal seed germination. b. Study of effect of UV light on germinating seeds. (2 hours)	Jain, VK (2017). <i>Fundamentals of Plant Physiology</i> . 19th edition. S. Chand Company Ltd., New Delhi.
August	01/08/2026	1	6. Study of types of meristems, simple and complex tissues using permanent slides. (2 hours)	Jain, VK (2017). <i>Fundamentals of Plant Physiology</i> . 19th edition. S. Chand Company Ltd., New Delhi.
	08/08/2026	1	7. a. Demonstration of phototropism and geotropism in plants. b. Demonstration of nyctinasty and seismonasty in plants. (2 hours)	Jain, VK (2017). <i>Fundamentals of Plant Physiology</i> . 19th edition. S. Chand Company Ltd., New Delhi.
	15/08/2026	-	Independence Day	

	22/08/2026	2	8. a. Comparison of oxygen evolution during photosynthesis in bright light and diffused light by inverted funnel method. (2 hours) b. Comparison of carbon dioxide evolution during respiration at room temperature and RT+10°C in germinating seeds using phenol red indicator. (2 hours)	Jain, VK (2017). Fundamentals of Plant Physiology. 19th edition. S. Chand Company Ltd., New Delhi.
	29/08/2026	1	9. a. Study of plasmolysis in Rheo leaf cells using sucrose solution. b. Study of imbibition in seeds. (2 hours)	Jain, VK (2017). Fundamentals of Plant Physiology. 19th edition. S. Chand Company Ltd., New Delhi.
September	05/09/2026	1	10. Study of basic instruments used for preparation of culture media and inoculation of seeds (demonstration). (2 hours)	
	12/09/2026	1	11. Understanding the use of Agribuddy App (or similar agriculture apps) for farm planning and crop management. (2 hours)	
	19/09/2026	-	Ganesh Chaturthi	
	26/09/2026	2	12. Visit to research institution. / Field visit to observe the plant diversity (Algae, Bryophytes, Pteridophytes, Gymnosperms and Angiosperms) (4 hours)	
October	03/10/2026	1	12. Identification of any two plant species using Google Lens or similar app. (2 hours)	
	10/10/2026	-	Practical Examination	

Assessment Rubrics

Component	Max Marks
ISA 1	NA
ISA 2	NA
ISA 3	NA
Practical	25
Project	NA
Semester End Exam	NA