

Practical Plan

Name of the college: Government College of Arts, Science & Commerce, Sanquelim-Goa		
Name of Faculty: Dr Smita Srivastava	Subject: Botany	
Paper code: BOT- 200	Program: B.Sc.	Batch: I
Academic year: 2026 – 2027	Semester: III	Total Practicals/Labs: 30 hours
Credits: 01		
Course Objectives: 1. Familiarize students with diverse groups of microbes and non-flowering plants. 2. Provide the ability to identify and classify microbes and non-flowering plant groups. 3. Impart knowledge of the morphology, life cycle, reproduction and economic importance of various microbes and non-flowering plants.		
Expected Course Outcome: On completion of this course, students will be able to: 1. Identify and classify microbes and non-flowering plants based on their characteristic features. 2. Compare and contrast the morphological features within and between the groups for a comprehensive understanding of the basis of their classification. 3. Examine the life cycle and methods of reproduction of microbes and non-flowering plant groups. 4. Appraise the economic importance of microbes and non-flowering plants.		
Student Learning Outcome: 1. Identify major groups of microbes and non-flowering plants using their distinguishing characteristics. 2. Classify microbes and non-flowering plants based on morphological and reproductive features. 3. Describe the morphology, life cycle, and reproduction of representative members of different groups. 4. Compare similarities and differences among microbes and non-flowering plant groups. 5. Explain the ecological and economic importance of microbes and non-flowering plants in agriculture, industry, medicine, and the environment. 6. Apply basic taxonomic knowledge to identify commonly encountered microbes and non-flowering plants during practical sessions		

Month	Practicals/Labs Scheduled Date	No. of Practicals / Labs planned	List of Experiments	Reference books
July	13/07/2026	1	1. Study of viruses (T-Phage, TMV) and bacteria using electron micrographs.	Kushwaha, AK (2020). Fungi, Viruses, Bacteria and Mycoplasma. Lambert Academic Publishing, U.K.
	20/07/2026	1	2.Study of bacteria by monochrome staining and Gram staining techniques.	Kushwaha, AK (2020). Fungi, Viruses, Bacteria and Mycoplasma. Lambert Academic Publishing, U.K.
	27/07/2026	1	3.Study of asexual and sexual stages of Mucor and Aspergillus (temporary mounts / permanent slides).	Santra, SC (2015). Practical Botany. Volume 1. New Central Book Agency (P.) Ltd., Kolkata.
August	3/08/2026	1	4.Study of Agaricus basidiocarp (button and mature stage); cross-section through gills to locate basidiospores.	Vashishta, BR and Sinha, AK (2014). Botany for Degree Students: Fungi. S. Chand and Company Pvt. Ltd., New Delhi.
	10/08/2026	1	5. Study of different types of lichen thalli (crustose, foliose and fruticose).	Vashishta, PC, Sinha, AK and Kumar, A (2006). Botany for Degree students: Gymnosperms. Ltd., New Delhi.
	17/08/2026	1	6. a. Study of endomycorrhizae using trypan blue staining method. b. Study of ectomycorrhizae (permanent slides or photographs).	Das, K (2023). Microbes and Plant Diversity. Mahaveer Publications, Assam.
	24/08/2026	1	7.Morphology of thallus and reproductive structures of Nostoc, Spirogyra, Sargassum and Polysiphonia (fresh or preserved specimens / permanent slides).	Sharma, OP (2011). Series on Diversity of Microbes and Cryptoga Algae. McGraw Hill Education India Pvt. Ltd., Chennai.
September	07/09/2026	1	8.Morphology of thallus and sporophyte of Riccia, Anthoceros and Funaria (fresh or preserved specimens / permanent slides).	Sharma, OP (2011). Series on Diversity of Microbes and Cryptoga Algae. McGraw Hill Education India Pvt. Ltd., Chennai.
	21/09/2026	1	9.Morphology and reproductive structures of Psilotum, Equisetum and Pteris (fresh or preserved specimens / permanent slides).	Vashishta, BR and Sinha, AK (2014). Botany for Degree Students: Fungi. S. Chand and Company Pvt. Ltd., New Delhi.

	28/09/2026	1	10.Morphology of Selaginella and L.S. of its strobilus.	Rashid, A (1998). An Introduction to Bryophyta. Vikas Publishing House Pvt. Ltd., Noida.
October	5/10/2026	1	11.Morphology and reproductive structures (male and female) cones of Cycas, Pinus and Gnetum (fresh / preserved specimens).	Parihar, NS (1991). An Introduction to Embryophyta. Volume I: Bryophyta. Central Book Depot, Allahabad.
	12/10/2026		Practical Examination	

Assessment Rubrics

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