

Practical Plan		
Name of the college: GOVERNMENT COLLEGE OF ARTS, SCIENCE AND COMMERCE, SANQUELIM- GOA		
Name of Faculty: MS. SHUBHA SHIVDAS KAUTHANKAR	Subject: BOTANY	
Paper code: BOC 108- Cytogenetics and Plant Breeding	Program: T.Y.B.Sc.	Division: -
Academic year: 2024- 2025	Semester: VI	Total Practicals/Labs: 15 × 4= 60 Hours
Credits: 2 (4 Hours)		
<p>Course Objectives: This course deals with basic and advanced concepts in cytogenetics and plant breeding along with their applications.</p> <p>Laboratory exercises provide training in understanding genetics through problem solving and skills of plant breeding such as emasculation and artificial pollination and its relevant applications in crop improvement.</p>		
<p>Expected Course Outcome: 1. Gain knowledge of the concepts used in Cytogenetics.</p> <ol style="list-style-type: none"> 2. Apply the principles of inheritance as formulated by Mendel. 3. Explain plant breeding methods. 4. Apply the knowledge of plant breeding in crop improvement. 		
<p>Student Learning Outcome: Gain knowledge in basic and advanced concepts in cytogenetics.</p> <p>Understand Mendelian genetics through problem solving exercises and apply the knowledge of cytogenetics in plant breeding.</p> <p>Understand the molecular basis of mutation and its phenotypic effect on the organism. Learn about the various methods of crop improvement. Develop skills in plant breeding such as emasculation, artificial pollination and induction of polyploidy.</p>		

Month	Practicals/Labs Scheduled Date	No. of Practical/Labs planned	List of Experiments	Reference books
December 2024	09/12/2024	4 HOURS	Mendel's laws through seed ratios.	<p>Verma, P.S. and Agarwal, V.K. 2009. Genetics. 9th revised edition. S. Chand & Co., New Delhi.</p> <p>Goswami, H.K. and Goswami, R. 1993. Practical Cytology, Applied Genetics and Biostatistics. 2nd revised edition. Himalaya Publishing House, Mumbai.</p> <p>Shukla, R.S. and Chandel, P.S. 2013. Cytogenetics, Evolution, Biostatistics and Plant Breeding. 5th edition. S. Chand & Company Pvt. Ltd., New Delhi.</p> <p>Singh, B.D. 2005. Plant Breeding: Principles and Methods. 7th edition. Kalyani Publishers, Ludhiana.</p>
December 2024	16/12/2024	4 HOURS	Problems on monohybrid, dihybrid cross and modified dihybrid ratios.	
January 2025	06/01/2025	4 HOURS	Problems on monohybrid, dihybrid cross and modified dihybrid ratios.	
January 2025	13/01/2025	4 HOURS	Study of stages in mitosis using Allium cepa root tips.	
January 2025	20/01/2025	4 HOURS	Preparation of karyotype from dividing Allium cepa root tip cells.	
January 2025	27/01/2025	4 HOURS	Study of stages in meiosis using Allium cepa /Rheo bicolor flower buds.	
February 2025	03/02/2025	4 HOURS	Study of stages in meiosis using Allium cepa /Rheo bicolor flower buds.	
February 2025	10/02/2025	4 HOURS	Estimation of pollen fertility in any 2 locally grown crop plants (e.g. Chilly, Brinjal)	
February 2025	17/02/2025	4 HOURS	Colchicine induced polyploidy.	
February 2025	24/02/2025	4 HOURS	Estimation of pollen-ovule ratio and its bearing on pollination system.	
March 2025	03/03/2025	4 HOURS	Emasculation and bagging of flowers of Brassicaceae and Malvaceae, pollinating them manually, estimating fruit and seed set.	
March 2025	10/03/2025	4 HOURS	Photo/Permanent slides showing translocation ring, laggards and inversion bridge.	
March 2025	17/03/2025	4 HOURS	Emasculation and bagging of flowers of Brassicaceae and Malvaceae, pollinating them manually, estimating fruit and seed set.	
March 2025	24/03/2025	4 HOURS	Colchicine induced mutation (root / shoot / germination / chromosomes).	
March 2025	31/03/2025	4 HOURS	Study of stages in mitosis using Allium cepa root tips.	
April 2025	04/04/2025	4 HOURS	Revision and journal certification	

*** Assessment Rubrics**

Component	Max Marks
ISA 1	10
ISA 2	10
Practical	50
Project	-
Semester End Exam	80

