



**PARVATHANENI BRAHMAYYA
SIDDHARTHA COLLEGE OF ARTS & SCIENCE**

Autonomous

Siddhartha Nagar, Vijayawada-520010

Re-accredited at 'A+' by the NAAC

22BOTL41: Cell Biology, Genetics and Plant Breeding

Offered to: BSc.BZC

Course Type: Practical (P)

Year of Introduction: 2022-23

Semester: IV

Credits: 3

60Hrs

Max.Marks: 50(15+35)

Course Prerequisites: Knowledge of Cell Biology, Genetics and Plant Breeding studied in intermediate.

Course Description: This course will provide one with a basic and comprehensive understanding of cell biology. Enable the student with depth of topics and helps them to gain an appreciation in the genetics. On the other hand, importance of understanding plant breeding provides an extensive knowledge to the student.

Course Objectives:

1. Knowledge of Cell Biology.
2. The study of Chromosomes.
3. The study of Mendelian and Non-Mendelian genetics.
4. Study of Structure and functions of DNA.
5. Knowledge of Plant breeding.

Course Outcomes: At the end of this course, students should be able to:

CO1: Distinguish prokaryotic and eukaryotic cells and design the model of a cell.

CO2: Explain the organization of a eukaryotic chromosome and the structure of genetic material.

CO3: Demonstrate techniques to observe the cell and its components under a microscope.

CO4: Discuss the basics of Mendelian genetics, its variations and interpret inheritance of traits in living beings.

CO5: Elucidate the role of extra-chromosomal genetic material for inheritance of characters.

Evaluate the structure, function and regulation of genetic material.

CO6: Understand the application of principles and modern techniques in plant breeding.

Explain the procedures of selection and hybridization for improvement of crops.

CO-PO MATRIX							
CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1						L	
CO2				M			
CO3				M			
CO4					H		
CO5						H	

Syllabus

1. Study of ultra-structure of plant cell and its organelles using Electron microscopic Photographs/models.
2. Demonstration of Mitosis in *Allium cepa*/*Aloe vera* roots using squash technique; observation of various stages of mitosis in permanent slides.
4. Demonstration of Meiosis in P.M.C.s of *Allium cepa* flower buds using squash technique; observation of various stages of meiosis in permanent slides.

4. Study of structure of DNA and RNA molecules using models.
5. Solving problems monohybrid, dihybrid, back and test crosses.
6. Solving problems on gene interactions (at least one problem for each of the gene interactions in the syllabus).
7. Chromosome mapping using 3- point test cross data.
8. Demonstration of emasculation, bagging, artificial pollination techniques for hybridization.

Course Delivery method: Face-to-face / Blended.

Course has focus on: Skill Development

Websites of Interest:

<https://youtu.be/LFvjJBiltFI>

<https://youtu.be/hUJZ4X3Hkbw>

<https://youtu.be/rBkE5SAL7IA>

Model Question Paper Structure for SEE

Time: 3hrs.

Max. Marks 35M

1. Make a cytological preparation of given material 'A' (mitosis or meiosis in Onion) by squash technique, report any two stages, draw labelled diagrams and write the reasons. **10M**
 2. Solve the given Genetic problem (Dihybrid cross/ Interaction of genes/ 3-point test cross) 'B' and write the conclusions. **8M**
 3. Identify the following and justify with apt reasons. **3x3 =9M**
- C. Cell Biology (Cell organelle)
 D. Genetics (DNA/RNA)
 E. Plant Breeding
4. Record + Viva-voce **5 + 3 = 8M**