

Kalindi College
DEPARTMENT OF BOTANY
Curriculum/Teaching Plan (2025-26)
(ODD Semesters : I, III, V)

Dr. Pratibha Thakur

Course : B. Sc. (Prog.) Life Science Botany, 2nd year, Sem. III [1st August 2025 – 27th Nov. 2025]

Paper : Plant Cell and Developmental Biology – PRACTICALS (NEP) Group - 4

UPC : 2162522301

DSC – 03

Name of Paper : Plant Cell and Developmental Biology	Allocation of Lectures	Month wise schedule	Reading suggestions
1. To study cytoplasmic streaming in <i>Hydrilla</i> .	1 Practical	August 2025	• Beck, C.B. (2010). An Introduction to Plant Structure and Development. Second edition. Cambridge University Press, Cambridge, UK.
2. a. Study of cell organelles through electron micrographs – nucleus, mitochondria, chloroplast, mitochondria, dictyosomes, endoplasmic reticulum b. Study of cell organelles (through permanent slides/photographs)– nucleus (Feulgen/acetocarmine staining); mitochondria (Janus green B staining); cell wall (PAS staining)	2 Practicals	August 2025	• Dickison, W.C. (2000). Integrative Plant Anatomy. Harcourt Academic Press, USA • Fahn, A. (1974). Plant Anatomy. Pergamon Press, USA • Mauseth, J.D. (1988). Plant Anatomy. The Benjamin/Cummings Publisher, USA • Esau, K. (1977). Anatomy of Seed Plants. John Wiley & Sons, Inc., Delhi.
3. Study of plant cells: types of stomata (through peel mounts), trichomes, sclerenchyma, xylem (through maceration).	2 Practicals	August 2025	• Taiz, L., Zeiger, E., Moller, I.M., Murphy, A. (2015). Plant Physiology. 6th edition. Sinauer Associates, Sunderland. USA.
4. Study of shoot apical meristem and root apical meristem, parenchyma, collenchyma, phloem, laticifers through permanent slides/micrographs.	2 Practicals	September 2025	• Hopkins, W.G., Huner, N.P.A. (2009). Introduction to Plant Physiology. Fourth edition, John Wiley & Sons, Inc. USA. • Bhojwani, S.S., Bhatnagar, S.P., Dantu, P.K. (2015). The Embryology of Angiosperms, 6th edition. New Delhi, Delhi: Vikas Publishing House. • Johri, B.M. (1984). Embryology of Angiosperms. Netherlands: Springer-Verlag.
5. Study organs structure through temporary preparations- a. Transverse section of dicot stem- <i>Helianthus/Cicer</i> , stem with secondary growth – <i>Helianthus/Cicer</i> etc., Transverse section of monocot stem - <i>Zea mays</i> b. Transverse section of dicot root: primary and with secondary growth- <i>Cicer/Vigna</i> etc., monocot root - <i>Zea mays</i>	3 Practicals	September 2025	• Raghavan, V. (2000). Developmental Biology of Flowering plants. Netherlands: Springer. • Shivanna, K.R. (2003). Pollen Biology and Biotechnology. New Delhi, Delhi: Oxford and IBH Publishing Co. Pvt. Ltd.

c. Vertical section of dicot and monocot leaf	1 Practical	October 2025	Additional Resources: • Cutler, D.F., Botha, T., Stevenson, D.W. (2007). Plant Anatomy - An Applied Aspect. Blackwell Publishing, USA • Bahadur, B. Rajam, M.V., Sahijram, L., Krishnamurthy, K.V. (2015). Plant Biology and Biotechnology. Volume 1: Plant Diversity, Organization, Function and Improvement. Springer (India) Pvt. Ltd. New Delhi, Heidelberg, New York, Dordrecht, London. • Shivanna, K.R., Tandon, R. (2014). Reproductive Ecology of Flowering Plants: A Manual. Springer (India) Pvt. Ltd. New Delhi, Heidelberg, New York, Dordrecht, London • Moza M. K., Bhatnagar A.K. (2007). Plant reproductive biology studies crucial for conservation. Current Science 92:1907.
6. Study anomalous secondary growth through permanent slides/photomicrographs: <i>Salvadora/ Bignonia, Dracaena</i>	1 Practical	October 2025	
7. Study reproductive structures through photographs/ micrographs/permanent slides/specimens: a. Transverse section of anther with wall layers, secretory and amoeboid tapetum b. Microsporogenesis through micrographs of transverse section anther c. Pollen exine patterns (any four types) d. Types of ovule, associated structure (obturator, aril, caruncle) e. Mature Polygonum type of embryo sac and ultrastructure of egg apparatus			
8. Study of pollen viability (TTC/FDA).	1 Practical	November 2025	
9. Calculation of percent pollen germination in any one medium through sitting drop culture/ /Hanging drop culture.	1 Practical	November 2025	
10. Dissection of embryo/endosperm from developing seeds.	1 Practical	November 2025	
• Revision • Mock Practical Exam		November 2025	