



**Swami Shraddhanand College  
(University of Delhi)**

Alipur, Delhi- 1100036

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**Lesson Plan**

<b>Name of Teacher</b>	<b>Dr. Ekta Singh Dr. Isha Gunwal</b>	<b>Department</b>	Botany
<b>Course</b>	<b>B.Sc. (P) Life Sciences</b>	<b>Semester</b>	III
<b>Paper</b>	<b>Plant Cell and Developmental Biology</b>	<b>Academic Year</b>	2023-2024
<b>Learning Objectives</b>			
To understand the basics of plant cell structure, development, growth and organisation of plant body.			
<b>Learning Outcomes</b>			
<p>On completion of the course, the students will</p> <ul style="list-style-type: none"> <li>• become familiar with the structure and functions of various components of plant cell</li> <li>• understand the processes of cell growth and its regulation</li> <li>• comprehend the structure, organization and functions of various tissues of the plant organs</li> <li>• get acquainted with the reproductive processes in the life cycle of angiosperms</li> <li>• appreciate the interactions between the developmental pathways resulting in the differentiation of plant body</li> <li>• recognise the importance of plant developmental biology in the improvement and conservation of plants.</li> </ul>			

## Lesson Plan

Week No.	Theme/ Curriculum
1. (21 <sup>st</sup> -27 <sup>th</sup> Aug 23)	Unit 1 Structure of plant cell, Structure and functions of cell organelles: cell wall (primary and secondary wall) (Dr. Ekta Singh) Unit-4 Flower development (ABCDE model) (Dr. Isha Gunwal)
2. (28 <sup>th</sup> -3 <sup>rd</sup> Sept 23)	Structure and functions of cell organelles: nucleus, chloroplast (Dr. Ekta Singh)  Anther and its wall layers ( <i>ontogeny not to be included</i> ), microsporogenesis and microgametogenesis. (Dr. Isha Gunwal)
3(4 <sup>th</sup> -10 <sup>th</sup> Sept 23)	Structure and functions of cell organelles mitochondria, dictyosomes. (Dr. Ekta Singh)  pollen wall (intine, exine), male germ unit (Dr. Isha Gunwal)
4(11 <sup>th</sup> -17 <sup>th</sup> Sept 23)	Structure and functions of cell organelle - endoplasmic reticulum (Dr. Ekta Singh)  Ovule: General structure, megasporogenesis (monosporic, bisporic, tetrasporic) and megagametogenesis (only Polygonum type) (Dr. Isha Gunwal)
5(18 <sup>th</sup> -24 <sup>th</sup> Sept 23)	UNIT-2 Growth through primary meristems ( <i>discuss briefly</i> ). (Dr. Ekta Singh)  ultrastructure and significance of female germ unit (Dr. Isha Gunwal)
6(25 <sup>th</sup> -1 <sup>th</sup> Oct 23)	Growth through secondary meristems ( <i>discuss briefly</i> ). (Dr. Ekta Singh)

	<p>UNIT-5</p> <p>Pollination types (Self and Cross; <i>agencies of pollination not to be included</i>)-(Dr. Isha Gunwal)</p>
7(3 <sup>rd</sup> -8 <sup>th</sup> oct 23)	<p>Organisation of shoot apex (Tunica-Corpus theory, Waiting meristem theory) and Organisation of root apex (Körper-Kappe theory) (Dr. Ekta Singh)</p> <p>Pollen-pistil interactions with brief overview of incompatibility. (Dr. Isha Gunwal)</p>
8(9 <sup>th</sup> -15 <sup>th</sup> oct 23)	<p>UNIT-3</p> <p>Structure and functions of simple tissues. (Dr. Ekta Singh)</p> <p>pollen tube pathway, pollen tube entry into ovule and embryo sac (porogamy, mesogamy and chalazogamy) (Dr. Isha Gunwal)</p>
9(16 <sup>th</sup> -22 <sup>th</sup> Oct 23)	<p>Structure and functions of complex tissues. (Dr. Ekta Singh)</p> <p>Double fertilization (Dr. Isha Gunwal)</p>
10 (23 <sup>th</sup> -29 <sup>th</sup> Oct 23)	<p>Structure of stem, root and leaf (dicot and monocot). (Dr. Ekta Singh)</p> <p>UNIT-6</p> <p>Endosperm structure (Free nuclear, Cellular and Helobial type, <i>one example of each</i>) and functions (Dr. Isha Gunwal)</p>
11 (30 <sup>th</sup> -5 <sup>th</sup> Nov 23)	<p>Brief mentioning of anomalous secondary growth in stem of <i>Salvadora/Bignonia</i> (Dr. Ekta Singh)</p> <p>development of embryo from zygote in monocot. (Dr. Isha Gunwal)</p>
12 (6 <sup>th</sup> -12 <sup>th</sup> Nov 23)	<p>Brief mentioning of anomalous secondary growth in stem of <i>Dracaena</i>. (Dr. Ekta Singh)</p> <p>development of embryo from zygote in dicot. (Dr. Isha Gunwal)</p>
13 (13 <sup>th</sup> -19 <sup>th</sup> Nov 23)	<p>Epidermal system: classification of stomata (Metcalfe and Chalk) (Dr. Ekta Singh)</p> <p>Development of embryo from zygote in monocot and dicot (Dr. Isha Gunwal)</p>
14(20 <sup>th</sup> -26 <sup>th</sup> Nov 23)	Internal Assessment Test
15(27 <sup>th</sup> -3 <sup>rd</sup> Dec 23)	<p>Trichomes. (Dr. Ekta Singh)</p> <p>development of seed (general account only) (Dr. Isha Gunwal)</p>

16(4 <sup>th</sup> -6 <sup>th</sup> Dec 23)	Revision of all the topics
<b>Suggested Readings</b>	
Books	<ol style="list-style-type: none"> <li>1. Beck, C.B. (2010). An Introduction to Plant Structure and Development. Second edition. Cambridge University Press, Cambridge, UK.</li> <li>2. Dickison, W.C. (2000). Integrative Plant Anatomy. Harcourt Academic Press, USA</li> <li>3. Fahn, A. (1974). Plant Anatomy. Pergamon Press, USA</li> <li>4. Mauseth, J.D. (1988). Plant Anatomy. The Benjamin/Cummings Publisher, USA</li> <li>5. Esau, K. (1977). Anatomy of Seed Plants. John Wiley &amp; Sons, Inc., Delhi.</li> <li>6. Taiz, L., Zeiger, E., Moller, I.M., Murphy, A. (2015). Plant Physiology. 6th edition. Sinauer Associates, Sunderland. USA.</li> <li>7. Hopkins, W.G., Huner, N.P.A. (2009). Introduction to Plant Physiology. Fourth edition, John Wiley &amp; Sons, Inc. USA.</li> <li>8. Bhojwani, S.S., Bhatnagar, S.P., Dantu, P.K. (2015). The Embryology of Angiosperms, 6th edition. New Delhi, Delhi: Vikas Publishing House.</li> <li>9. Johri, B.M. (1984). Embryology of Angiosperms. Netherlands: Springer-Verlag.</li> <li>10. Raghavan, V. (2000). Developmental Biology of Flowering plants. Netherlands: Springer.</li> <li>11. Shivanna, K.R. (2003). Pollen Biology and Biotechnology. New Delhi, Delhi: Oxford and IBH Publishing Co. Pvt. Ltd.</li> </ol>
<b>Online Resources (If Any)</b>	
<b>Assignment and Class Test Schedule for Semester</b>  <b>Assignments: Submission by 10<sup>th</sup> November 2023</b>  <b>Class Test: On the date as notified by the College</b>	

