

Theory Paper

Part A Introduction			
Program: Diploma		Class: B.Sc.	Year: III Semester
2023-24			
Subject: Botany			
1.	Course Code	S2-BOTA1T	
2.	Course Title	Plant Anatomy and Embryology	
3.	Course Type (Core Course/ Discipline Specific Elective/Elective/ Generic Elective /Vocational/....)	Major	
4.	Pre-requisite (if any)	To study this course, a student must have had subject botany in B.Sc. I year/ certificate course.	
5.	Course Learning outcomes (CLO)	On successful com their course, the students will be able to: Students will learn the internal structure of plants. It will enhance the basic understanding of organization of plant body by cells and tissues. Students will understand the dynamic mechanism of plant pollination, fertilization and development. They will have hands on training on section cutting, preparation of slides, study of pollen and ovules.	
6.	Credit Value	4 credits	
7.	Total Marks	* Marks: 40+60 Passing Marks: 35	

Part B-Content of the Course		
Total No. of Lectures- 60 Tutorials- 0 Practical-0 (theory 2 hours per week)		
Unit	Topics	No. of Lectures
I	<p>Topics</p> <p>Meristematic and permanent tissues</p> <p>1.1 Types of meristems,</p> <p>1.2 Organization of Root and shoot apex</p> <p>1.3 Simple and complex tissues.</p> <p>1.4 Special type of tissues.</p> <p>1.5 Structure of dicot and monocot root, stem and leaf</p> <p>Kranz anatomy.</p> <p>1.6 Pits and plasmodesmata;</p> <p>1.7 Wall ingrowths and transfer cells.</p> <p>1.8 Hydathodes, cavities, lithocysts and laticifers</p>	12
II	<p>Secondary Growth:</p> <p>1.1 Vascular cambium-structure, function and seasonal activity.</p> <p>1.2 Secondary growth in root and stem,</p> <p>1.3 Wood (heartwood and sapwood).</p> <p>1.4 Anomalous structures.</p> <p>1.5 Adaptive and protective systems: Epidermis, cuticle, stomata;</p> <p>1.6 General account of adaptations in xerophytes and hydrophytes.</p> <p>1.7 Dendrochronology.</p>	12
III	<p>Embryology:</p> <p>1.1 History and Importance of embryology,</p> <p>1.2 Structure of flower, anther and pollen,</p> <p>1.3 Micro-sporogenesis and Mega-sporogenesis;</p> <p>1.4 Structure and types of ovules;</p> <p>1.5 Types of embryo sacs,</p> <p>1.6 organization and ultra structure of mature embryo sac.</p>	12
IV	<p>Pollination and fertilization</p> <p>1.1 Types of Anthers and pollen,</p> <p>1.2 Pollination mechanisms and adaptations;</p> <p>1.3 Pollen pistil interaction,</p> <p>1.4 Double fertilization;</p> <p>1.5 Post fertilization changes,</p> <p>1.6 Seed structure appendages and dispersal mechanisms.</p>	12

	1.7 Palynology and Scope (a brief account)	
V	Endosperm & embryo 1.1 Endosperm types, structure and functions; 1.2 Dicot and monocot embryos; 1.3 Embryo- endosperm relationship, s 1.4 Nutrition of Embryo, 1.5 Unusual features in Embryo and Endosperm, and polyembryony, Definition, types and 1.6 Apomixis practical applications. 1.7 In-vitro fertilization	
Keywords/Tags: Meristematic and permanent tissues, plasmodesmata, Hydathodes, cavities, lithocysts, laticifers, Secondary Growth, Vascular cambium Wood, Xerophytes hydrophytes, Dendrochronology, Embryology, Embryo-sac, Pollination, Fertilization, Embryo, Endosperm Apomixis, polyembryony		

Part C-Learning Resources	
Text Books, Reference Books, Other resources	
Suggested Readings: <ol style="list-style-type: none"> 1. Bhojwani, S.S. & Bhatnagar, S.P. (2011). Embryology of Angiosperms. Vikas Publication House Pvt. Ltd New Delhi. 5th edition. 2. Dickison, W.C. (2000). Integrative Plant Anatomy. Harcourt Academic Press, USA. 3. Fahn, A. (1974). Plant Anatomy. Pergmon Press, USA. 4. Mauseth, J.D. (1988). Plant Anatomy. The Benjamin/Cummings Publisher, USA. 5. Evert, R.F. (2006) Esau's Plant Anatomy: Meristems, Cells, and Tissues of the Plant Body: Their Structure, Function and Development. John Wiley and Sons, Inc. 6. Johri, B.M. (1984) Embryology of Angiosperms Springer-Verlag, Berlin Heidelberg. 7. Maheshwari, P. Introduction of embryology of Angiosperm, Tata McGrawhill publication co. (1971) 8. Pandey, B.P. plant anatomy S. Chand & company (1986) 9. Pandey S.N. and Chaddha A., Plant anatomy and embryological development Publishing house Pvt. <p>Suggestive digital platforms/ web links:</p> <ol style="list-style-type: none"> 1. https://www.davuniversity.org/images/files/study-material/EDU246%20BOTANY%202.pdf 2. https://gache.ac.in/pdf/ematerial/18BB043C-U3.pdf 3. https://uou.ac.in/sites/default/files/sim/BSCBO-202.pdf 	

Part D-Assessment and Evaluation		
Suggested Continuous Evaluation Methods:		
Maximum Marks: 100		
Continuous Comprehensive Evaluation (CCE): 40 marks University Exam (UE) 60 marks		
Internal Assessment: Continuous Comprehensive Evaluation (CCE): 40	Class Test Assignment/Presentation	15+25 = 40
External Assessment: University Exam Section: 60 Time: 03.00 Hours	Section(A): Very Short Questions	60
	Section (B): Short Questions	
	Section (C): Long Questions	
	Total	