Semester	**VI**
Course	**Major-1**
Paper Title	**PLANT PHYSIOLOGY AND DEVELOPMENTAL ANATOMY**
Paper Code	
No of Credits	**4 (3+1)**
Theory /Practical /Composite	Composite
Minimum No. of preparatory hours per week a student has to devote	3
Number of Modules	2
Syllabus	**Module A: Plant Physiology [30 Marks (2 classes per week)]** **UNIT I:** • Photosynthesis-Photosynthesis pigments, concept of two photosystems, light reactions, cyclic and non-cyclic photophosphorylation; carbon dioxide fixation, Calvin's cycle, C4 plants, CAM plants, photorespiration, compensation point. • Nitrogen fixation in plants. **UNIT II:** Growth and development: Plant growth regulators (auxin, cytokinin, gibberellin, abscisic acid, ethylene): Biosynthesis, transport, signaling, application. **UNIT III:** Light signaling in Plants:Phytochrome, cryptochrome, phototrophins, concept of photoperiodism and circadian rhythm. **Module B: Developmental Anatomy [15 Marks (1 Class per week)]** **Unit IV:** 1. Plant tissue systems, primary and secondary growth, anomalous secondary growth. 2. Patterning of indeterminate growth; Shoot and root apical meristem and their histological organization. 3. Leaf Anatomy; formation and specification of lateral organs. 4. Floral organ identity genes and their role; ABCD and ABCDE models; 5. Applications of anatomy in forensics, pharmacognosy and dendrochronology. **PRACTICAL [40 marks; End-Sem (8 marks) + CA (30 marks) + Attendance (2 marks)]** 1. Auxin estimation 2. Assay of enzymes involved in plant 3. Estimation of Chlorophyll 4. Microscopic studies on anatomical features of stem and root including a few anomalous structures
Learning Outcomes	1. Students will be introduced to plant physiology and

<table>
<tr><td></td><td colspan="2">biochemistry.
2. This will give students an understanding of the essential physiological processes in plants.
3. They will get a glimpse of the signalling pathways involved in these physiological processes.
4. They will understand the concepts and theories of plant anatomy.
5. In the practical module students will be introduced to experiments used for study of plant physiology and biochemical processes.
6. Students will be provided with hands on training on experiments and techniques to study plant anatomy</td></tr>
<tr><td>Reading / Reference List</td><td colspan="2">1) Plant Physiology- Taiz & Zeiger
2) Biochemistry & Molecular Biology of Plants – Buchanan
3) Plant Structure and Development – Charles B. Beck, Cambridge University Press; 2011.
4) Essentials of Developmental Plant Anatomy Taylor A. Steeves and Vipen K. Sawhney; Oxford University Press; 2017
5) Plant Anatomy – A Fahn; Permagon Press 1972.
6) Esau's Plant Anatomy; Ray F. Evert, John Wiley & Sons; 2006
7) Relevant Research and Review Papers</td></tr>
<tr><td>Evaluation</td><td>Theory
CIA- 10
Assignment – 02
Attendance - 03
End Semester Exam- 45</td><td>Practical
CA- 30
Attendance - 02
Semester Exam- 08</td></tr>
<tr><td>Paper Structure for Theory Semester Exam</td><td colspan="2">Module A (30 Marks):
• Compulsory short questions - 10 marks [2 x 5]
• Subjective two questions out of three, 10 marks each, i.e. 10 x 2= 20 marks [subparts not less than 2 marks]
Module B (15 Marks):
• Compulsory objective question - 5 marks [1 X 5]
• One question 10 marks out of two, i.e. 10 x 1=10 [May have subparts not less than 2 Marks]</td></tr>
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