

<b>Course</b>	<b>Discipline Specific Core</b>
Semester	II
Paper Number	MBTCR2042T & MBTCR2042P
Paper Title	PLANT PHYSIOLOGY
No. of Credits	6
Theory/Composite	Composite
No. of periods assigned	4 Theory + 4 Practical
Course description/objective	<ol style="list-style-type: none"> <li>1. Students will be introduced to plant physiology and biochemistry.</li> <li>2. This will give students an understanding of the essential physiological processes in plants.</li> <li>3. They will get a glimpse of the signalling pathways involved in these physiological processes.</li> <li>4. They will understand the concepts and theories of plant anatomy.</li> <li>5. In the practical module students will be familiarized with laboratory techniques and equipments used for study of plant physiology and biochemistry.</li> <li>6. In the practical module students will be made familiar with laboratory techniques and equipments used for study of plant anatomical experiments.</li> </ol>
Syllabus	<p><b>Theory</b></p> <p><b>Module A: (15 marks)</b></p> <p><b>UNIT I: Anatomy:</b> The shoot and root apical meristem and its histological organization, simple &amp; complex permanent tissues, primary structure of shoot &amp; root, secondary growth, growth rings, leaf anatomy (dorsi-ventral and isobilateral leaf)</p> <p><b>No. of Classes:</b> 1 Class per week</p> <p><b>Module B: (35 marks)</b></p> <p><b>UNIT II: Plant Water relations:</b> Importance of water to plant life, diffusion, osmosis, plasmolysis, guttation, transpiration. Macro &amp; micro nutrients: Essentiality of nutrients; Solute transport across the membrane, Long distance transport through xylem and phloem; mechanisms of loading and unloading of photoassimilates</p> <p><b>UNIT III: Carbon &amp; nitrogen metabolism:</b> Photosynthesis-Photosynthesis pigments, concept of two photo systems, photophosphorylation , physiology of bacterial photosynthesis: light reactions, cyclic and non-cyclic photophosphorylation; carbon dioxide fixation, Calvin's cycle, C4 plants, CAM plants, photorespiration, compensation point. Nitrogen metabolism- inorganic &amp; molecular nitrogen fixation, nitrate reduction and ammonium assimilation in plants.</p> <p><b>UNIT IV: Growth and development:</b> Definitions, phases of growth, growth curve, Plant growth regulators (auxin, cytokinin, gibberellin, abscisic acid, ethylene): Mode of action, biosynthesis, storage, breakdown, transport and application; Concepts of RAM and SAM; flower development.</p> <p><b>UNIT V: Light signaling in Plants:</b> Phytochrome, cryptochrome,</p>

	<p>phototrophins, concept of photoperiodism and vernalization; Seed dormancy and seed germination.</p> <p><b>No. of Classes:</b> 3 Classes per week</p> <p><b>Practical</b></p> <ol style="list-style-type: none"> <li>1. Demonstration of transpiration.</li> <li>2. Isolation of (photosynthetic pigments) chlorophyll</li> <li>3. Auxin estimation</li> <li>4. Demonstration assay of enzymes involved in plant</li> <li>5. Preparation of stained mounts of anatomy of monocot and dicot's root, stem &amp; leaf.</li> </ol>
Readings	<ol style="list-style-type: none"> <li>1) Plant Physiology- Taiz &amp; Zeiger</li> <li>2) Biochemistry &amp; Molecular Biology of Plants – Buchanan</li> <li>3) Plant Anatomy - Pijush Roy.</li> <li>4) Plant Anatomy – A Fahn</li> </ol>
Evaluation	<p>Theory: Continuous Internal Assessment: 10 marks End-Semester Theory Examination: 50 marks</p> <p>Practical: Continuous Internal Assessment: 32 marks End-Semester Examination: 8 marks</p>
Paper Structure for End Sem Theory	<p>Module A (15 Marks) One question 15 marks, i.e. 15 x 1=15</p> <p>Module B (35 Marks) Compulsory objective question - 5 marks Subjective three questions out of five, 10 marks each, i.e. 10 x 3= 30 marks.</p>