Course	**Discipline Specific Core**
Semester	II
Paper Number	**MBTCR2042T & MBTCR2042P**
Paper Title	**PLANT PHYSIOLOGY**
No. of Credits	6
Theory/Composite	Composite
No. of periods assigned	4 Theory + 3 Practical
Course description/objective	1. Students will be introduced to plant physiology and 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 familiarized with laboratory techniques and equipment used for study of plant physiology and biochemistry. 6. In the practical module students will be made familiar with laboratory techniques and equipment used for study of plant anatomical experiments.
Syllabus	**Theory** **Module A: (15 marks)** UNIT I: Anatomy: The shoot and root apical meristem and its histological organization, simple & complex permanent tissues, primary structure of shoot & root, secondary growth, growth rings, leaf anatomy. No. of Classes:1 /week **Module B: (35 marks)** UNIT II: Plant Water relations: Importance of water to plant life, diffusion, osmosis, plasmolysis, guttation, transpiration. Macro & micro nutrients: Essentiality of nutrients; Solute transport across the membrane, Long distance transport through xylem and phloem; mechanisms of loading and unloading of photoassimilates UNIT III: Carbon & nitrogen metabolism: 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 & molecular nitrogen fixation, nitrate reduction and ammonium assimilation in plants. UNIT IV: Growth and development: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. UNIT V: Light signaling in Plants:Phytochrome, cryptochrome, phototrophins, concept of photoperiodism and vernalization; Seed dormancy and seed germination.

	No. of Classes: 3 /week **Practical** **1. Demonstration of transpiration.** **2. Isolation of (photosynthetic pigments) chlorophyll** **3. Auxin estimation** **4. Demonstration assay of enzymes involved in plant** **5. Preparation of stained mounts of anatomy of monocot and dicot's root, stem & leaf.**
Readings	**1) Plant Physiology- Taiz & Zeiger** **2) Biochemistry & Molecular Biology of Plants – Buchanan** **3) Plant Anatomy - Pijush Roy.** **4) Plant Anatomy – A Fahn**
Evaluation	**Theory: Continuous Internal Assessment: 10 marks End-Semester Theory Examination: 50 marks** **Practical: Continuous Internal Assessment: 32 marks End-Semester Examination: 8 marks**
Paper Structure for End Sem Theory	**Module A (15 Marks)** **One question 15 marks, i.e. 15 x 1=15 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.**