

**BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI**  
**INSTRUCTION DIVISION**  
**FIRST SEMESTER 2016-17**  
**(Course Handout Part II)**

Date: 02.08.2016

In addition to part I (general handout for all courses appended to the timetable) this portion gives further specific details regarding the course.

**Course No** : **BIO F312**  
**Course Title** : **Plant Physiology**  
**Instructor-In charge** : **JITENDRA PANWAR**  
**Instructor** : **B. Vani**

**1. Course Description:**

Basic functional processes in plants; Plant tissue system, Plant-water relations, Gaseous exchange, Stomatal regulations, Mineral nutrition and absorption, Transport of material, Growth and development, Hormones and PGRs, Photoperiodism, Vernalization, Plant defense mechanisms, Stress Physiology and related lab components.

**2. Scope & Objective:**

This course attempts to make the students aware of the major features of physiology of plants. Emphasis will be given to function and adaptations as related to the survival of plants in their natural environment.

**Text Book:**

Taiz, L. and Zeiger, E., Plant Physiology, 3<sup>rd</sup> Ed., Panima Publishing Corporation, Indian Reprint, 2003

**Reference books:**

Taiz, L. and Zeiger, E., Plant Physiology, 5<sup>th</sup> Ed., 2010, Sinauer Associate Inc., Sunderland, USA

**Web Topics:** <http://6e.plantphys.net/>

**Course plan:**

Lect. No.	Learning objective	Topic	Ref. to Chapter
<b>Part A</b>	<b>Plant Physiology</b>		
1	Getting introduced to the subject and course	Orientation to the course, Introduction to Plant Physiology	--
2-4	Overview of Plant Structure	Plant Tissue System	Class Notes/ Web topic 1.4
5-7	Learning water and its interaction with plant body	Structure and properties of water, Diffusion, Osmosis and Water potential	TB-3, RB-3
8-10	How plants obtain water from the soil?	Water balance in plants: root absorption and transport through xylem	TB-4, RB-4
11-13	The transpiration /	Transpiration and its compromise	TB-4, RB-4

	photosynthesis paradox	with photosynthesis, Stomatal regulations	
14-15	Mineral requirements for plant growth	Mineral Nutrition: Essential elements and their function	TB-5, RB-5
16-18	How are nutrients absorbed and distributed in tissues	Mineral Nutrition: Absorption of minerals, Mycorrhizal fungi	TB-5, RB-5
19-20	How are nutrients absorbed and distributed in tissues	Transport of solutes and ions, Membrane transport processes	TB-6, RB-6
21-22	How are metabolic end products distributed in plants?	Transport of material in phloem	TB-10, RB-10
23-25	How do plants grow?	Growth and development	TB-16, RB-16
26-28	What controls plant growth?	Hormones and Growth regulators: Auxins and Gibberellins	TB-19, 20 RB-19, 20
29-31	What controls plant growth?	Cytokinins, Absciscic acid	TB-21, 23 RB-21, 23
32-35	How plants control the timing of flowering?	Phytochrome, Photoperiodism and Vernalization	TB-17, 24 RB-17, 25
36-38	How plants defend themselves against adverse biotic factors?	Secondary metabolites and Plant Defense Mechanisms	TB-13, RB-13
39-41	How plants defend themselves against adverse abiotic factors?	Stress physiology: Water, Heat, Chilling & Salinity stress	TB-25, RB-13

#### Evaluation scheme:

S. No.	Evaluation Component	Duration	Weightage (%)	Date, Time & Venue	Remarks
1.	Mid-Semester Test	90 min	30	<TEST_1>	CB
2.	Quizzes/ Practical Assignment		25		CB+OB
3.	Comprehensive	3 hours	45	<TEST_C>	CB+OB

**Chamber consultation hour:** To be announced in the class.

**Notices:** All notices will be displayed on the notice board of Department of Biological Sciences.

**Make-up policy:** Make-up decisions will be made on a case-by-case basis and only genuine cases as determined by the team and validated by Wardens and/or Medical Officer will be considered. No make-ups for Quizzes.

**Instructor-in-charge**  
**BIO F312**