**BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI**
**INSTRUCTION DIVISION**
**FIRST SEMESTER 2015-16**
**(Course Handout Part II)**

Date: 03.08.2015

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 : **B. VANI**
Instructor : **Jitendra Panwar**

**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, 3rd Ed., Panima Publishing Corporation, Indian Reprint, 2003

**Reference books:**
Taiz, L. and Zeiger, E., Plant Physiology, 5th Ed., 2010, Sinauer Associate Inc., Sunderland, USA

**Web Topics:** http://5e.plantphys.net/index.php

**Course plan:**

| Lect. No. | Learning objective | Topic | Ref. to Chapter |
|---|---|---|---|
| **Part A** | **Plant Physiology** | | |
| 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 |

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|---|---|---|---|
| | 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<br>RB-19, 20 |
| 29-31 | What controls plant growth? | Cytokinins, Abscisic acid | TB-21, 23<br>RB-21, 23 |
| 32-35 | How plants control the timing of flowering? | Phytochrome, Photoperiodism and Vernalization | TB-17, 24<br>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 | 6/10 2:00 - 3:30 PM | CB |
| 2. | Quizzes/ Assignment | | 25 | | |
| 3. | Comprehensive | 3 hours | 45 | 4/12 FN | Partly 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**