

Module title: Plant physiology I

Lecturer: A. Einali (assistant prof.)

Assessments: 40% mid-term exam
50% final exam
10% Quiz

References:

1. Plant Physiology, 2002

Lincoln Taiz and Eduardo Zieger

2. Introduction to Plant Physiology, 4th edition, 2008

William G. Hopkins and Norman P. A. Huner

3. Introductory Plant Physiology, 1983

Glenn Ray Noggle, George John Fritz

Module subjects:

1. Water and Plant Cell

1st week: Plant physiology definition, the structure and properties of water

2nd week: Water transport processes, Osmosis

3rd week: Water potential, Entrance of water to the cell

4th week: Hoffer's diagram, water transport rate

2. Water Balance of Plants

5th week: Water in the soil, Water absorption by roots

6th week: Root pressure, guttation, Water transport through the xylem

7th week: The cohesion-Tension theory, water evaporation in the leaf

8th week: Water movement from the leaf to the atmosphere, *mid-term* exam

3. Mineral Nutrition

9th week: Essential nutrients, deficiencies, and plant disorders

10th week: Mineral deficiencies symptoms, analysis of plant tissue

11th week: Treating nutritional deficiencies, fertilizers

12th week: Soil, roots, and microbes, root systems, mycorrhizae

4. Assimilation of mineral nutrients

13th week: Nitrogen in the environment

14th week: Nitrate assimilation, ammonium assimilation

15th week: Biological nitrogen fixation, Nitrogenase enzyme

16th week: Sulfur assimilation, phosphate assimilation, cation assimilation, oxygen assimilation, *Preparation for final exam*