University Of Jordan
Dept. Of Biological Sciences

Plant Physiology 352
Course outline

Prof. Dr. Samih Tamimi

Office: Greenhouse building*

Spring semester 09/10.

Topics covered during the course include:

1.Plant Water Relationship:

1.1 Water and Plants

The water molecule, Properties of water, Movement of water in plants and Water potential.

1.2 Transpiration

Nature and types of transpiration
Stomatal transpiration: stomatal structure.
Distribution and mechanism of opening.
Factors affecting stomatal opening, control of transpiration.

1.3 Water absorption by roots

The route of water movement in the root, forces involved in water absorption, active and passive absorption, factors influencing the rate of absorption.

1.4 Ascent of sap

Xylem structure, forces involved in water movement up the plant, the transpiration cohesion theory.

2.Mineral nutrition

Essential elements: function and criteria of essentiality, Soils and their minerals, available forms of minerals, ion uptake, mineral deficiency

3.Photosynthesis

light: nature, energy and interaction with materials
Chlorophyll, chloroplast and light harvesting mechanisms
Photosynthetic reaction centers
The excitation of chlorophyll and the light reactions
Formation of ATP and NADPH
The Calvin cycle (PCR)
The C4 and CAM plants
Photorespiration
Control of photosynthesis

4.Phloem translocation

Source-sink concept, phloem structure, features of phloem translocation, Mechanism of phloem loading, the pressure flow hypothesis, unloading, control of phloem translocation.

5.Plant growth

Nature of plant growth, measurement, growth kinetics, control of growth

6.Phytohormones

Auxins, Gibberellins, Cytokinins, ethylene and ABA: Nature, transport, physiological role and mechanism of action .

7.Phytocrome and photomorphogenesis

Developmental processes controlled by light, phytochrome nature and its role in the control of light regulated processes eg. Stem elongation.
Flowering Photoperiodism and the role played by phytochrome.

8.Stress Physiology

Drought, flooding, heat stress, and salinity: Responses of plants to these stresses, adaptations, tolerance and physio-ecological significance.

9.Seed physiology

Seed structure, germination, quiescence and dormancy, starch and lipid metabolism during germination, control of germination.

*Office hours: Please **visit www.physiology352.blogspot.com**

Suggested text books

1.Introduction to Plant Physiology by William G. Hopkins, 3rd edition, 2004. John Wiley & Sons Inc. ISBN: 978-0-471-38915-6 (highly recommended).
2.Plant Physiology by F.Salisbury and C. Ross. 4th edition, 1992. Wads-Worth publishing Company. (good reference)
3.Plant Physiology by Taiz & Zeiger. 3rd edition, 001. The Benjamin/Cummings Publ. Co. Inc. (somewhat advanced)

***Lecture supplements, links and powerpoint presentations can be downloaded from* www.physiology352.blogspot.com**

Exams and grades

Exam	Date	Grades
Mid-term	Week 8	30%
Mid-term lab	Week 9	10%
Final Theory Final lab	As declared To be announced	35% 15%
Lab. reports and Evaluation		10%

Lab syllabus will be distributed during the first lab meeting.