



Course Syllabus: Plant Physiology & Adaptation - PS 202

Division	Biological and Environmental Sciences & Engineering Division
Course Number	PS 202
Course Title	Plant Physiology & Adaptation
Academic Semester	Spring
Academic Year	2016/2017
Semester Start Date	01/22/2017
Semester End Date	05/18/2017
Class Schedule (Days & Time)	01:00 PM - 02:30 PM Mon Thu

Instructor(s)				
Name	Email	Phone	Office Location	Office Hours
Mark Alfred Tester	Mark.Tester@KAUST.EDU.S A	+966128082922	3233, 2, Ibn Al-Haytham (bldg. 2)	I can be contacted any time by email, at mark.tester@kaust.edu.sa . We can usually make a time talk within 24 hours, either directly or via Skype.

Teaching Assistant(s)	
Name	Email

Course Information	
Comprehensive Course Description	In this course, a broad overview of plant structure and function will be provided. The course will start with an introduction to plant architecture and plant genomes, then move on to cover the fundamental plant processes of water and nutrient transport, and the central plant operations of photosynthesis and C metabolism. Control of stomatal apertures will be studied in more depth, as will the translocation of photosynthates in the phloem, culminating with a look at lipid metabolism and the assimilation of inorganic nutrients. After an introduction to the fundamentals of the biochemistry of signal transduction, the course will then move on to a more detailed examination of plant responses to the environment, and how plants adapt to their environment. There will be five lectures on plant responses to biotic stress, and then five lectures on plant responses to abiotic stress.
Course Description from Program Guide	The aim of this course is to provide an overview of plant structure and function, covering a range of plant processes such as water and nutrient transport and the central plant operation of photosynthesis and C metabolism. The course will end with an introduction to the interactions of plants with their environment, studying responses to challenges from both the biotic and abiotic world.
Goals and Objectives	By the end of this course, students will have a good fundamental knowledge of several aspects of plant function, and will be able to apply this to understand mechanisms employed by plants to tolerate a range of biotic and abiotic stresses.
Required Knowledge	A basic knowledge of chemistry is assumed, and the fundamentals of molecular and cellular biology are required. No previous knowledge of plants is necessary.
Reference Texts	The course will closely follow the textbook: "Plant Physiology and Development", 6th ed. by Lincoln Taiz, Eduardo Zeiger, Ian Møller, Angus Murphy (2015, Sinauer).

Method of evaluation	80.00% - Exam 1 10.00% - Oral Quizzes 10.00% - Oral presentation
Nature of the assignments	Students will present several informal oral presentations through the course, based on the material presented in the textbook.
Course Policies	Unexplained absences for any class will result in 1 percentage point being deducted from the final grade.
Additional Information	

Tentative Course Schedule

(Time, topic/emphasis & resources)

Week	Lectures	Topic
1	Mon 01/23/2017 Thu 01/26/2017	Introduction to the course Plant and cell architecture
2	Mon 01/30/2017 Thu 02/02/2017	Genome structure Control of gene expression
3	Mon 02/06/2017 Thu 02/09/2017	Epigenetics - a brief introduction Water and plant cells
4	Mon 02/13/2017 Thu 02/16/2017	Water balance of plants Mineral nutrition
5	Mon 02/20/2017 Thu 02/23/2017	Solute transport Photosynthesis - the light reactions
6	Mon 02/27/2017 Thu 03/02/2017	Photosynthesis - the carbon reactions Photosynthesis - physiological and ecological considerations
7	Mon 03/06/2017 Thu 03/09/2017	Stomatal biology Translocation in the phloem
8	Mon 03/13/2017 Thu 03/16/2017	Respiration and lipid metabolism Assimilation of inorganic nutrients
9	Mon 03/20/2017 Thu 03/23/2017	Cell walls - structure, formation and expansion Signals and signal transduction
10	Mon 03/27/2017 Thu 03/30/2017	Signals and signal transduction (continued) Biotic interactions - introduction to interacting organisms
11	Mon 04/03/2017 Thu 04/06/2017	Biotic interactions - pathogenic interactions - fungi Biotic interactions - pathogenic interactions - bacteria
12	Mon 04/10/2017 Thu 04/13/2017	Biotic interactions - beneficial interactions - N ₂ fixation Biotic interactions - beneficial interactions - mycorrhizas
13	Mon 04/17/2017 Thu 04/20/2017	Abiotic stress - high and low light Abiotic stress - ion toxicities
14	Mon 04/24/2017 Thu 04/27/2017	Abiotic stress - low nutrients Abiotic stress - high and low temperature
15	Mon 05/01/2017 Thu 05/04/2017	Abiotic stress - high and low water Tutorial session
16	Mon 05/08/2017 Thu 05/11/2017	Student presentations
17	Mon 05/15/2017 Thu 05/18/2017	
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Note

The instructor reserves the right to make changes to this syllabus as necessary.