



Course Syllabus: Advanced Plant Molecular Genetics - PS 303

Division	Biological and Environmental Sciences & Engineering Division
Course Number	PS 303
Course Title	Advanced Plant Molecular Genetics
Academic Semester	Spring
Academic Year	2016/2017
Semester Start Date	01/22/2017
Semester End Date	05/18/2017
Class Schedule (Days & Time)	10:30 AM - 12:00 PM Sun Tue

Instructor(s)				
Name	Email	Phone	Office Location	Office Hours
Magdy M Mahfouz	magdy.mahfouz@kaust.edu.sa	+966128082761 8082761		Instructor(s) Name(s): Magdy M. Mahfouz Email: magdy.mahfouz @kaust.edu.sa Office Location: Building #2, Office 3232 Office Hours: By appointment

Teaching Assistant(s)	
Name	Email

Course Information	
Comprehensive Course Description	PS303 course will cover advanced topics in the key biological processes of plants in a molecular, genetics, and genomics context. The course will provide a broad coverage of the current concepts and techniques of plant molecular genetics and genomics and their application to crop productivity and improvement. Special emphasis will be placed on recent publications in the research of these topics involving gene regulation, plant growth and development, abiotic stress, hormones, nutrition, and epigenetics.
Course Description from Program Guide	This course will cover the key biological processes of plants in a molecular, genetics, and genomics context. The course will provide a broad coverage of the current concepts and techniques of plant molecular genetics and genomics and their application to crop productivity and improvement. Special emphasis will be placed on recent publications in the research of these topics involving plant growth and development, abiotic/biotic stresses, metabolism, hormones, nutrient relations, and epigenetics.

Goals and Objectives	Students will be able to describe current concepts in advanced plant molecular genetics and genomics and explain the genetics and molecular basis underlying plant growth, reproduction, development, nutrition, cell signaling, abiotic stress adaptation. Students will be able to develop critical thinking, analysis and evaluation skills in applying knowledge in the class to solve real research questions. Students will be able to develop skills and expertise in researching literature as well as reading, writing and evaluating research publications. This course will also cover the understanding and appreciation of the connections of plant molecular genetics and genomics to society.
Required Knowledge	Prerequisites: B209 Molecular Genetics
Reference Texts	Students will be provided with a list of selected recent research papers and reviews to cover the topics in PS303 course. Students are encouraged to refer to Biochemistry and Molecular Biology of Plants, 2nd Edition, textbook to enrich their background in multiple topics.
Method of evaluation	20.00% - Group Project(s) 30.00% - Written report 30.00% - Scientific review article presentation 20.00% - Course Project(s)
Nature of the assignments	A. Class Presentations B. Weekly Paper Critiques, Reviews, and Discussions C. Writing assignments D. Research Proposal (Final Exam)
Course Policies	Class presence and participation are required for the PS303 course. Students are encouraged to actively participate in the discussion of research papers. Participation in class discussions is very important part of the learning process in the PS303 course. Students are evaluated on the quality of their contributions and insights. Quality comments offer different perspectives and move the discussion and analysis forward.
Additional Information	

Tentative Course Schedule

(Time, topic/emphasis & resources)

Week	Lectures	Topic
1	Sun 01/22/2017 Tue 01/24/2017	Introduction to plant gene expression regulation
2	Sun 01/29/2017 Tue 01/31/2017	Presentations from selected key papers on gene expression regulation
3	Sun 02/05/2017 Tue 02/07/2017	Post-transcriptional gene regulation
4	Sun 02/12/2017 Tue 02/14/2017	Presentations from selected key papers on post-transcriptional gene regulation
5	Sun 02/19/2017 Tue 02/21/2017	Introduction to gene splicing
6	Sun 02/26/2017 Tue 02/28/2017	Presentations from selected key papers on gene splicing
7	Sun 03/05/2017 Tue 03/07/2017	Alternative splicing in plants
8	Sun 03/12/2017 Tue 03/14/2017	Presentations from selected key papers on alternative splicing in plants
9	Sun 03/19/2017 Tue 03/21/2017	Alternative splicing and abiotic stress
10	Sun 03/26/2017 Tue 03/28/2017	Key presentations on alternative splicing and abiotic stress responses
11	Sun 04/02/2017 Tue 04/04/2017	Plant adaptation to abiotic stresses
12	Sun 04/09/2017 Tue 04/11/2017	Presentations from selected key papers on plant adaptation to abiotic stresses
13	Sun 04/16/2017 Tue 04/18/2017	Epigenetics
14	Sun 04/23/2017 Tue 04/25/2017	Presentations from selected key papers on epigenetic regulation in plants
15	Sun 04/30/2017 Tue 05/02/2017	Research Proposal Defense I
16	Sun 05/07/2017 Tue 05/09/2017	Research Proposal Defense II
17	Sun 05/14/2017 Tue 05/16/2017	
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Note

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