

BSPM/SOCR 740 – Plant Molecular Genetics -

Instructor:

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Course Description:

A class on plant molecular genetics, methods and techniques in plant molecular and cellular biology, and an introduction to research topics, through lectures and discussions of scientific literature.

Pre-requisites

Basic knowledge of genetics, basic knowledge of molecular biology

Learning Outcomes:

- Acquire advanced knowledge of Plant Molecular Biology and Genetics
- Learn how plant genetic and molecular biology research is performed and be familiar with the techniques involved and methods used
- Develop readings skills and critical thinking in relation to scientific literature

Classwork:

Each week, students will learn about fundamental aspects of plant genetics and plant molecular biology through lectures (usually on Thursdays). The concepts and techniques learned in the preceding lecture will be exemplified in assigned scientific literature. Students will be asked to complete problems based on the scientific articles presented. In class, students will discuss the scientific papers, evaluating the hypotheses, techniques used, data presented, as well as the main conclusions. During the discussions students will be exposed to different areas of plant molecular biology research. All students will be urged to actively participate in the discussion of the papers assigned, through mediation by the instructor. **Cell phones must be turned off during class; violators will be asked to bring treats for the class.**

Optional Recitation Sessions:

Optional Recitation/Bioinformatics/Lab Sessions will be held on some Wednesdays from 3-6pm. These are extra-curricular activities and attendance is optional.

Grading:

Final grade will be based on weekly problem sets (10%), quizzes (10%), attendance and in-class participation during article discussions (10%), midterm exam (30%) and final exam (40%).

Attendance Policy:

Attendance is highly recommended. Any absences must be well justified and explained to the instructor.

Accommodations for Students with a Disability Policy:

Any student who suspects s/he may need an accommodation based on the impact of a disability should contact the class instructor privately to discuss the student's specific needs and provide written documentation from the Office of Resources for Disabled Students. If the student is not yet registered as a student with a disability, s/he should contact the Office of Resources for Disabled Students.

An important note about academic integrity:

At Colorado State University we take academic integrity very seriously. At minimum, academic integrity means that no one will use someone else's work as his or her own, and that the contents of someone's work represent solely his or her own efforts.

Plagiarism is the unauthorized or unacknowledged use of another person's academic or scholarly work. Done on purpose, it is cheating. Done accidentally, it is no less serious. Regardless of how it occurs, plagiarism is a theft of intellectual property and a violation of an ironclad rule demanding "credit be given where credit is due."

If you plagiarize in your work or accept and/or provide unauthorized help you could lose credit for your work, fail the assignment, or fail the course, or even result in expulsion from the university. Each instance of plagiarism, classroom cheating, and other types of academic dishonesty will be addressed according to the principles published in the CSU General Catalog (see page seven, column two:

<http://www.catalog.colostate.edu/FrontPDF/1.6POLICIES1112f.pdf>).

For the CSU Student Honor Pledge please visit:

<http://tilt.colostate.edu/integrity/honorpledge/index.cfm>

For more information of how to practice academic integrity please visit:

<http://learning.colostate.edu/integrity/index.cfm>

Library & Research Help:

The CSU Libraries Help Desk <http://lib.colostate.edu/helpdesk> provides both research (Ph. 970-491-1841) and technical (Ph. 970-491-7276) support. Neyda Gilman is the faculty librarian supporting this course. Please don't hesitate to contact her for assistance at neyda.gilman@colostate.edu or 970-491-7436. Find her weekly open (drop-by) office hours posted at <http://libguides.colostate.edu/neydagilman>. Students should ask for her at the Morgan Library Help Desk. Cancellations will be noted on the calendar at <http://libguides.colostate.edu/neydagilman>.

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Lecture	Topic
1	Introduction to the course; Crop and Model Plant Species; Studying Gene Function in Plants I: Natural and Induced Genetic Variation; Genetic Screens
2	Studying Gene Function in Plants II: Insertional Mutagenesis (T-DNA and Transposons); TILLING; Mutant and Germplasm Collections and Databases
3	QUIZ 1 ; Paper Discussion
4	Studying Gene Function in Plants III: Genetic Analyses of Mutants,
5	Paper Discussion
6	Genetic Mapping in Plants
7	QUIZ 2 ; Paper Discussion
8	Genetic Complementation: Stable and Transient Plant Transformation; Gene Stacking (Guest Lecturer Dr. Tessa Albrecht, BSPM)
9	Paper Discussion
10	Studying Gene Function in Plants IV: Small RNAs and Gene Silencing; RNAi and Viral Induced Gene Silencing
11	Sequencing Genes and Genomes (Guest Lecturer Dr. Lucas Argueso, EHRS)
12	NO CLASS
13	QUIZ 3 ; Paper Discussion
14	Studying Gene Function in Plants V: Genome Editing
15	Paper Discussion and Review Session
16	MIDTERM EXAM
17	Phenomics / Marker Assisted Selection/ Genome-Wide Association Studies in plants
18	Paper Discussion
19	Plant Metabolomics (Guest Lecturer Dr. Corey Broeckling, PMF)
20	Plant Proteomics (Guest Lecturer Dr. Corey Broeckling, PMF)
21	Paper Discussion
22	Studying Plant Gene Expression
23	QUIZ 4 ; Paper Discussion
24	Studying Protein-Protein Interactions
25	Paper Discussion
26	Studying Plant Cell Biology
27	FALL RECESS
28	QUIZ 5 ; Paper Discussion
29	Plant Systems Biology
30	Paper Discussion
31	Plant Synthetic Biology (Guest Lecturer Dr. Mauricio Antunes, Biology)
32	FINAL EXAM