

PLANT MOLECULAR GENETICS
SOCR 740/BSPM 740
FALL, 2013

Location: E005 Plant Sciences Building
Time: 11:00 AM - 12:15 PM on Tuesday/Thursday
Prerequisites: SOCR 330 (Principles of Genetics) or equivalent and BC463 (Molecular Genetics) or equivalent

Instructor: Dr. Nora Lapitan
(http://www.soilcrop.colostate.edu/find_a_person/faculty/lapitan_intro.htm)

Contact information 491-1921; Nora.Lapitan@Colostate.edu

Office hours: By appointment

COURSE DESCRIPTION:

SOCR 740 covers advances in the study of plant genome organization, function, and evolution, and technologies for studying genomes and plant traits at the genome-wide scale. Students can expect to gain knowledge of the latest findings in plant genomics, the theories behind genomics technologies and their use in studying complex traits in plants.

CLASS GUIDELINES:

Class Participation and Attendance: Class participation is graded and regular attendance is highly encouraged.

Class presentations and recitation: Students will be assigned papers prior to each lecture topic and are expected to be ready to discuss the material in class.

Class materials: There is no textbook for the class. The class relies on journal articles which will be assigned ahead of time. Handouts, reading materials, assignments, review questions, etc., will be available at RamCT.

GRADING:

Homeworks, class presentations, recitation	35%
2 exams	40%
Proposal and oral presentation	25%

TOPICS

I. Genome Organization and Evolution

- Molecular Structure of the Chromosome, Centromere, and Telomere
- Types of DNA Sequences and Organization in Eukaryotic Genomes
- Characterization of Plant Genomes through Whole Genome Sequencing

II. The Epigenome

- Transposable Elements
- Small RNAs
- Chromatin Structure and Regulation of Gene Expression

III. Functional Genomics

- Transcriptomics
- Proteomics and Metabolomics
- Assigning function to genes through Reverse Genetics

IV. Genome Mapping

- Principles of Genetic Mapping
- Quantitative Trait Loci Mapping
- Genome-wide Association Analysis

V. Comparative Genomics

VI. Bioinformatics and Genome Databases