PLANT GENOMICS
PBIO / PLPA 5301
FALL 2014

TU/TH 1:30 - 2:45 pm
ROOM 146 McNEAL HALL
ST PAUL CAMPUS, UNIVERSITY OF MINNESOTA

INSTRUCTOR
Nevin Dale Young
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Office hours are flexible. Send an email to schedule an appointment or just visit with me before or after class. Students may also feel free to visit me in my office (320 Cargill) during my regular office hours, Fridays 9:00 – 10:00am throughout the semester.

Overview

Plant Genomics is a course for graduate and advanced undergraduate students interested in applications of genomics and bioinformatics to the study of plants. Students learn strategies for genomic analysis by exploring sequencing technology, model systems, comparative genomics, sequence variation, genome expression, and genome evolution. Students also develop an understanding about the fundamentals of sequence analysis, database searches, and data-mining through computer labs and independent projects. Class sessions consist of lectures, discussions, small group activities, plus hands-on computer labs.

Prerequisites

Introductory course in genetics – or – consent of instructor.

Learner Outcomes

In Plant Genomics students learn:
• How to analyze DNA and protein sequence data
• How to navigate genome databases
• How to sequence a genome
• How to annotate a genome sequence
• How to compare the organization and evolution of different genomes
• The importance of genome duplication in plant evolution
• How to measure levels of genome transcription
• How to discover and measure genome variation

Requirements

Everyone who attends class must enroll formally. This includes students who are taking Plant Genomics for credit as well as those who plan to audit. Because class participation is a formal part of the final grade, students need to attend every class. If you expect to miss a class for a valid reason, please inform me by email a day or two ahead of time.

Active participation is expected every time, so assigned readings should be completed before coming to class. To promote student participation, Plant Genomics requires the use of i>clicker technology, which can be purchased at the University Bookstore for $30.25 (2014 estimate). To find i>clickers at the UMN Bookstore, visit the section labeled “PBio 5301” even if you registered for class through PPa 5301. We will use i>clickers for a variety of activities, including mini-quizzes, class discussions, and computer labs.

Readings

All readings for 2014 are found on the internet, with links found on the course Moodle site. There is no requirement for students to purchase a textbook or packet, though you may choose to print out articles and lecture outlines.

Grading

200 points Two (2) In-class Exams: 100 points each
120 Two (2) Take-home Exams: 60 points each
60 Student Project and Presentation: 60 points
40 Mini-quizzes: 40 points (12 x 4 points each; Two lowest dropped)
20 Homework: 20 points total (6 x 4 points each; Lowest one dropped)

TOTAL: 440 points

There are NO plans for offering extra credit in this class.

A  =>  95.0 — 100
A- =>  90.0 — 94.9
B+ =>  87.0 — 89.9
B  =>  83.0 — 86.9
B- =>  80.0 — 82.9
C+ =>  77.0 — 79.9
C  =>  73.0 — 76.9
C- =>  70.0 — 72.9
D+ =>  67.0 — 69.9
D  =>  60.0 — 66.9
F  =>  59.9 or less
Exams

There will be two in-class exams -- each approximately 70 minutes in length – on October 21 and November 25. Each exam will be preceded by a Review Session that takes place during the class period immediately before the exam. There are generally no make-ups, so in the case of a documented excused absence from an exam, the final semester grade will be based on the remaining exams, quizzes, project, and assignments. In-class exam consist of five to eight medium-length essay questions or problems.

There will also be two take-home exams starting on September 18 and November 6. Take-home exams will be accessible through the class Moodle site, where answers can also be submitted. More details about these exams will be provided in class.

Class Activities and Homework

To provide practical experience with genome databases and data-mining, there will be a variety of in-class activities, computer labs, problem sets, and homework. These activities will be relatively short and frequently connected to specific labs.

Group Project

The final assignment will be a multi-week activity that begins approximately November 11 and culminates with in-class group presentations on December 4 and 9. This project consists of an internet-based analysis and powerpoint where students work together in small groups. Everyone is expected to turn in both group and individual reports electronically. More details will be provided on November 11 and throughout the time of the assignment.

Handouts

Most classes are accompanied by lecture handouts, which are .pdf versions of material presented in class. These handouts can be downloaded from Moodle and are generally available before class. Some readings also have study guides.

For some classes, there is also one or more video links providing deeper information about a specific topic. In certain cases, the video replaces class (due to instructor travel). Other videos are optional. Videos are accessible through the Moodle site and generally work on all computers or mobile devices.

Computer Labs and Electronic Technology

Several times during the semester, we have classes that are primarily computer activities. Therefore, students should have access and bring laptops and/or tablet devices to class whenever possible. During class, electronic devices can only be used
for class activities during the time of class sessions, which will be clear from class instructions. Phones may never be used during class and should be set to airplane- or silent-mode before class begins.

Sometimes, we may need to change the location of class if special facilities are required, which will be announced ahead of time and also posted on the Moodle site. During lab classes, students should plan to work in pairs to explore different bioinformatic tools, websites, and databases. Generally, a handout with computer lab instructions will be available on the Moodle website ahead of time.

**Course Communication**

Electronic communication during the semester will be through X500 email and the course Moodle site. Therefore, students should plan to read their X500 email account and visit the course Moodle site regularly (several times a week).

**Late Assignments**

In cases where an assignment or take-home exam is submitted after the deadline, the grade will be reduced one letter grade if turned in one day late and two letter grades if turned in two days late. Late assignments submitted more than two days late will be accepted on a case-by-case basis, generally requiring documentation that justifies handing in a late assignment. Making arrangements with the instructor ahead of time is strongly encouraged.

**Grade Disputes**

Grade disputes for any assignment or exam should be submitted in writing or email to the instructor **within one week of receiving a disputed grade**. If the dispute can not be resolved satisfactorily, the assignment will be given to an expert outside of class to provide input. Please remember that re-graded exams and assignments can potentially be lowered as well as raised.

**Students with Disabilities and Equal Access**

All registered students, independent of race, gender, sexual preference, employment background, primary language, or disability, receive equal treatment and equal access to class materials in Plant Genomics. Students with a disability should contact University Disability Services (612-624-4037) or the instructor.

**Student Code, Scholastic Honesty, and Appropriate Use of Course Materials**

Students in Plant Genomics are expected to do their own work and submit their own assignments (unless explicitly stated otherwise). Except when explicitly stated by the instructor or in an assignment’s instructions, students are prohibited from
copying and pasting materials directly from the internet or copying material from another student.

Nevertheless, collaboration and communication among students is encouraged. I will make it clear when a graded activity can include collaboration and/or shared responses. Details about the University of Minnesota’s student honor code are found at: http://www1.umn.edu/regents/policies/academic/StudentConduct.pdf.