BIOD30 Plant Research& Biotechnology: Addressing Global Problems
Course Syllabus Fall 2019

This course is about developing the skills to read the primary literature in Plant Science and developing strategies and skills to fully appreciate the research undertaken by these plant scientists. It will also provide a broad overview of how plants may help us face the major challenges of having a healthy planet and having a well-fed human population across the world.

The knowledge you learn in this course is valuable for understanding the relationship of basic research to applications that help society. Students who make a strong effort can expect to become better problem solvers and critical readers of scientific literature, and can also expect to develop the ability to identify what intellectual resources and techniques are required to attack a particular problem. BIOD30 can also help you be a better science-literate citizen in a complex world. If you keep up with the learning activities of this course it also can be fun!

The University of Toronto is dedicated to fostering an academic community in which the learning and scholarship of every member may flourish, with vigilant protection for individual human rights, and a resolute commitment to the principles of equal opportunity, equity and justice. The instructor Clare Hasenkampf and Teaching Assistant Carina Carianopol of BIOD30 fully endorse this policy. Welcome all!

We are using an electronic textbook, Plants, Genes and Agriculture, Sustainability through Biotechnology. Chrispeels and Gepts are the authors; it is published by Sinauer Associates. **This is a required textbook with a major assignment from it.** You can rent the book (180 days for $49.98 US) by going to the following link https://www.redshelf.com/book/816865/plants-genes-and-agriculture-816865-9781605357188

Amazon.ca has paper copies available for $124 Can.
One copy is available in the course reserves for 3 hr use.

All of the non-textbook reading assignments can be found on the BIOD30 Quercus site in the 'Library Course Reserves section.

INTERACTION TIMES AND COMMUNICATION METHODS

Class meets 5-8 on Thursdays in BV361; this time includes both the lecture and tutorial. Some days the class will mostly be lecture and others it will be mostly tutorial.
Attendance is expected for the entire class period. We will take 10 min breaks after each 50 min of activity and we may not always go until 8pm but you should plan as if we will.

The Quercus course site will be the place to find links to the required readings, see course announcements and find any resources I post. Be sure you know how to access and use Quercus.

Dr. Hasenkampf office hours are
Mondays 8:30-10am in SY246 (except for Sept 24 and Oct 1 when they will be in SW250)
Thursdays 8-9 pm in BV361, through Nov 28th.

Please address all email questions to Dr. Hasenkampf at hasenkampf@utsc.utoronto.ca. Please use your U of T email account. Allow 2 working days for a response (but often response times will be quicker than that).

Senior graduate student Carina Carianopol will be the TA for the course, she will be working with you on enhancing your reading of the primary literature in the course's tutorial.

Course evaluations for this course and all UTSC courses will be done on-line; please participate. Your assessments and

insights are important to me in particular and the university in general!

TURNITIN

Normally, students will be required to submit their course essays to Turnitin.com for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their essays to be included as source documents in the Turnitin.com reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University's use of the Turnitin.com service are described on the Turnitin.com web site".

We are using TurnItIn in BIOD30 for the research paper assignment.

LEARNING GOALS FOR STUDENTS

1. Students will be able to identify distinctive features of plants and plant cells and systems that allow them to be used for translational research that addresses global problems.

2. Students will be able to identify the molecular, computational and high through-put tools used to improve crop plants.

3. Students will be able to identify essential features of testable hypotheses and develop skill in developing and assessing experiments that test hypotheses.

4. Students will improve their ability to analyze complex problems by identifying the key terms, concepts and techniques they need to solve a specific problem and gain experience in how to develop strategies/experiments to address these problems.

5. Students will improve their skill in scientific communication with peers and professional scientists and in presenting and defending hypotheses.

6. Students will learn to efficiently find and use library and internet resources and cite articles correctly.

7. Students will become more proficient at working collaboratively as part of a team to accomplish personal and group learning goals. This includes learning to distribute a task's workload equitably and to give each other constructive active feedback in a professional and constructive manner.

8. Students will practice their leadership skills within the context of team discussions and assignments.

9. Students will practice communicating as a professional in all correspondence for this course including: emails to team mates, TAs and instructor, organization of project notes, and oral and written assignments.

Course Activities (note topic order/dates might change a little as necessary to complete topics)

Sept 5 Lecture: Course overview, plant challenges, Life's macromolecules (*online quiz watch Quercus for opening and closing dates)*
tutorial: with Professor Hasenkampf, about reading scientific articles, concept mapping, and the team project.

Sept 12 Lecture: Photosynthesis *(online quiz watch Quercus for opening and closing dates)*
tutorial: with Professor Hasenkampf, chapter selection, Q&A, Biotechnology article *with reading quiz 1 at the beginning of tutorial*

Sept 19 Lecture: Plant Development (*online quiz watch Quercus for opening and closing dates*)
tutorial: with Professor Hasenkampf, discussing social and political aspects of molecular crop improvement;
Biotechnology article *with reading quiz 2 at the beginning of tutorial*

Sept 26 Lecture: Guest speaker Professor Obidimma Ezezika tutorial: speaker debrief with Professor Hasenkampf

Oct 3 Lecture: Food Security and Plant Biotechnology 1 (*online quiz watch Quercus for opening and closing dates)*
tutorial: with teaching assistant Carina Carianopol preparing for Professor Mott visit *with reading quiz 3 at the beginning of tutorial*

Oct 10 Lecture: Plant Biotechnology 2 (online quiz watch Quercus for opening and closing dates)
tutorial: with teaching assistant Carina Carianopol preparing for Professor Mott visit *with reading quiz 4 at the beginning of tutorial*

Oct 17 No class it's Reading Week!

Oct 24 Lecture: Guest Speaker Professor Mott tutorial: speaker debrief with teaching assistant Carina Carianopol

October 31 tutorial first: with teaching assistant Carina Carianopol preparing for Professor Gonzales-vigil visit *with reading quiz 5 at the beginning of tutorial*
'Lecture': lecture completion (if needed) + Workshop for student presentations
Dr Hasenkampf available to discuss team project.

Nov 7 tutorial first: with teaching assistant Carina Carianopol preparing for Professor Gonzales-Vigil visit *with reading quiz 6 at the beginning of tutorial*
'Lecture': Workshop for student presentations
Dr Hasenkampf available to discuss team project.

Nov 14 Guest Speaker Professor Gonzales-Vigil presentation
tutorial: speaker debrief with teaching assistant Carina Carianopol

Nov 21 Student Project Presentations

Nov 28 Student Project Presentations

Marking Scheme

20% Quizzes
Quizzes on Dr Hasenkampf's lectures (~4) will be review quizzes posted online after each lecture
Reading quizzes (~6) will occur at the beginning of the tutorial

6% Lecture/tutorial Concept map summaries
There will be two concept map assignments each worth 3% of final grade.
The first concept map will relate to use of and constraints associated with biotechnology. (guest speaker 1 and biotechnology lectures and tutorials) *due Oct 24th*

The second lecture/tutorial concept map will relate to biotic stress and guest speakers 2 &3 and the related tutorials, *due Nov. 21st*

If student is absent from the relevant guest speaker presentations and/or tutorials, the relevant concept map will only be worth 2%; the other 1% moves to final exam.

40% Student/Team Project

In this part of the course your team will select one of the following chapters from the textbook (Chapter 15, 16,17,19,20 or 21). As a team of 2 or 3 (3 if we have an odd number of students) the entire team will carefully read a chapter, create one concept map for the chapter, answer the 'End of Chapter' questions and prepare a 20-25 min presentation of the chapter to the class. Teams will also do a research paper on a topic related to the chapter they have selected.

- Selected Chapter Concept Map 4/40 *done by team due Sept 26th*

- Selected Chapter Your Answers to 'End of Chapter' Questions, 'shallow research' ok for this assignment, but cite sources. *done by team*. 6/40 *due October 31st*

- Research paper topic and selected papers *0.5/40 due Nov 7th*

- In class Team Oral Presentation *14.5/40 Nov 21st or 28th sign up for your date*
  20-25 min lecture on the part of chapter most relevant to your research topic *done by team*
  30-35 min research paper analysis
  both topics, combined should be no longer than 60 min. Be prepared for 10 min Q&A.

Written Research paper analysis (same topic as in oral research presentation), integrated with other things you have learned in the course, as relevant. *15/40 due Dec 2nd , submit via TurnItIn*
done individually- entire paper must be in each student's own words

Note if a student is absent from any other student presentations with a valid excuse, their Chapter concept map is worth only 2%, the other 2% moves to the final exam.

For the research paper and related oral presentation students must feature 3 related primary research articles (more are not expected but are acceptable). Additionally, if useful students can discuss and cite relevant review articles to supplement the two primary research articles. Please note, students need to have read any articles that are cited.

For the individually written research paper please follow the following format. Research papers can be between 1000-2000 words in length, excluding Tables, Figure legends and the References Cited. (Dr Hasenkampf will stop reading after 2000 words)

- Create an Introduction in your own words that provides the relevant background for the topic to allow the reader to appreciate the importance of the work that will be described. The Introduction should also provide the theoretical background to the project to allow the reader to understand the hypothesis being tested and the rationale for the reason the experiments were done. Cite relevant textbook, review article or research paper.
- Next create a Results section that considers, in your own words, the experimental data of the primary research articles. Indicate in your own words, how the authors interpret their data. If you disagree with their interpretation or want to expand on it, please do so.
- End the paper with a discussion, in your own words, of the significance of the experiments done and lastly indicate how it relates to the chapter you selected.
- Provide a Literature Cited for any articles/books you cite within your research paper.

34% Final exam (date determined by the registrar)

The final exam will be on Dr. Hasenkampf's lectures, the assigned readings, guest speaker's topics. As well there will be team-specific questions about each team's selected Chapter/topic project that probe each team member's understanding of team topic.

The exam will be semi-open book you can bring

- Dr. Hasenkampf's posted slides
- your concept maps

- articles associated with the three visiting speakers and the biotechnology tutorial with any notes you add in margins, plus a copy of your own research paper.

Some of you may be taking this course credit/no credit. That is fine, you are welcome in this course. But please realize that everyone's learning in this course is interconnected to the work done by other students. The more different students there are that take the readings and work seriously, the more learning will occur. Also, for the team project all team members must be contributing strongly to the success of the team project.
Therefore in order to pass this course a student must pass the course overall and also pass the 40% of the grade that is based on the team projects.

Projected(likely) Quiz dates
Quizzes (lecture quizzes are online, reading quizzes will be at the beginning of the relevant tutorial); these are the projected dates if lectures and tutorials occur as planned.

Lecture online quiz 1 Sept 5-10
Lecture online quiz 2 Sept 12-17
Reading Quiz 1 Sept 12
Reading Quiz 2 Sept 19
Lecture online quiz 3 Sept 19-24
Reading Quiz 3 Oct 3
Reading Quiz 4 Oct 10
Lecture online quiz 4 Oct 10-22
Reading Quiz 5 Oct 31
Reading Quiz 6 Nov 7

Assignment Dates

Assignment	Due date
Student team project, Chapter Concept Map	Sept 26 submit at beginning of class
Lecture/tutorial Biotechnology, Food security, public trust,Concept Map 1	Oct 24 submit at beginning of class
Student team project 'End of Chapter' questions answered	Oct 31 typed, submit at beginning of class
Research paper topic selected primary research articles selected	Nov 7 typed, submit at beginning of class
Lecture/tutorial Concept Map 2	Nov 21 submit at beginning of class
Student team Presentations	Nov 21 or 28th during class
Individual student research papers.	Dec 2, submit via TurnItIn

POLICY ON ABSENCES/MISSED DEADLINES

If you are prevented from attending a class /tutorial or you miss a term work deadline you can provide the required documentation as indicated below.

The departmental Policy on Missed Term Tests and missed Term Assignments can also be found at https://www.utsc.utoronto.ca/biosci/missed-term-work-policy.

For unexcused missed assignment deadlines, there is a 5% penalty per day late.

ACADEMIC INTEGRITY

The University (and the BIOD30 team) treats cases of cheating and plagiarism very seriously. The University of Toronto's *Code of Behaviour on Academic Matters* (http://www.governingcouncil.utoronto.ca/policies/behaveac.htm) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences.

Potential offences in papers and assignments include using someone else's ideas or words without appropriate acknowledgement, submitting your own work in more than one course without the permission of the instructor, making up sources or facts, obtaining or providing unauthorized assistance on any assignment.

On tests and exams cheating includes using or possessing unauthorized aids, looking at someone else's answers during an exam or test, misrepresenting your identity, or falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes.

Please avoid academic dishonesty, have confidence in your own ability to learn and grow academically by doing your own thinking and writing! I know you can learn a lot about genetics and yourself in this course.

ACCESSABILITY

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the AccessAbility Services as soon as possible.

AccessAbility Services staff (located in AA142) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations 416-287-7560 or email ability@utsc.utoronto.ca. The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.