



The University of Manitoba
Faculty of Agricultural and Food Sciences

Course Details

Course Title: Advanced Plant Physiology

Department: Plant Science

Academic Session: Winter 2022

Hours: 2:00 - 4:30 PM (Mondays)

Course Web Page: UM Learn @ <https://universityofmanitoba.desire2learn.com/d2l/login>

Course Number: PLNT 7612

Credit Hours: 3

Location: delivered remotely

Instructor Contact Information

Instructor: Dr. Belay Ayele

Office Location: Room 111 Agriculture Building

Research Lab Location: Room 112 Crop Technology Center, 194 Dafoe Road

Office Phone Number: 474-8227

Email Address: belay.ayele@umanitoba.ca

Office Hours: 10:00 - 11:00 am (Thursdays)

General Course Information

Why This Course is Useful?

This course is designed to enrich students' knowledge of plant physiology with a range of contemporary and emerging aspects of the subject. The course is useful to strengthen students' analytical and higher order thinking skills with respect to plant physiological processes and mechanisms.

Who Should Take This Course?

The course has considerable value to graduate students in preparation for advanced research and teaching positions in diverse areas of specialization in plant science. The course builds on the basic concepts discussed in foundation courses in the area of plant/crop physiology, expanding their knowledge in the physiological aspects of plant growth, development, and its interaction with the surrounding environment.

Course Goals

Graduate calendar description: Examination of current concepts of regulation and limitations of photosynthesis, nitrogen metabolism, and assimilate partitioning in field and horticultural crops. Content will include the mode of action of plant growth regulators and herbicides in these processes. Prerequisites: PLNT 3400 (or the former PLNT 3500), PLNT 4590 or consent of instructor.

Instructional Methods: Oral class presentations and discussions. Students will be assigned or pick review/research articles that will focus on current research topics in the area of plant physiology, and are required to present it to their peers and lead the discussion. The presentation should be based on the concepts from the key original research papers referenced by the review author(s). The class will meet once a week for a period of ~3 hours in which an assigned/selected topic will be presented by a student in the first ~1 hour. The presentation will be followed by class discussion to review key points of the article (s). The instructor will facilitate the discussion.

Student presentations are delivered remotely using a synchronous course design. Your computer/device and internet connection must meet the UM minimum requirements found here <https://centre.cc.umanitoba.ca/wp-content/uploads/2020/04/Student-Connectivity-Recommendations.pdf>. This course requires additional specialized software: WebEx. Students can access events scheduled by the instructor via accessing Cisco WebEx on this course's website on UM Learn.

Course goals: The goal of this course is to give students a greater understanding on the significance of major discoveries of physiological mechanisms that regulate plant growth and mediate its response to the environment.

Intended Learning Outcomes

On completion of the course, students are expected to have the ability to think analytically and develop logical arguments with respect to plant physiological processes and mechanisms. They are also expected to have improved oral and written communication skills, and an in depth appreciation of specific topics in plant physiology.

Using Copyrighted Material

Please respect copyright. We will use copyrighted content in this course. Copyrighted works, including those created by me, are made available for private study and research and must not be distributed in any format without permission. Do not upload copyrighted works to a learning management system (such as UM Learn), or any website, unless an exception to the *Copyright Act* applies or written permission has been confirmed. For more information, see the University's Copyright Office website at <http://umanitoba.ca/copyright/> or contact um_copyright@umanitoba.ca.

Recording Class Lectures

No audio or video recording of lectures or student presentations and class discussions is allowed in any format, openly or surreptitiously, in whole or in part without permission from Dr. Ayele. Course materials (both paper and digital) are for the participant's private study and research, and must not be shared. Violation of these and other Academic Integrity principles, will lead to serious disciplinary action.

Course Technology

It is the general University of Manitoba policy that all technology resources are to be used in a responsible, efficient, ethical and legal manner. The student can use all technology in classroom setting only for educational purposes approved by instructor and/or the University of Manitoba Disability Services. Student should not participate in personal direct electronic messaging / posting activities (e-mail, texting, video or voice chat, wikis, blogs, social networking (e.g. Facebook) online and offline "gaming" during scheduled class time. If student is on call (emergency) the student should switch his/her cell phone on vibrate mode and leave the classroom before using it. (©S Kondrashov. Used with permission)

Class Communication

The University requires all students to activate an official University email account. For full details of the Electronic Communication with Students please visit: [http://umanitoba.ca/admin/governance/media/Electronic Communication with Students Policy - 2013 09 01 RF.pdf](http://umanitoba.ca/admin/governance/media/Electronic_Communication_with_Students_Policy_-_2013_09_01_RF.pdf). Please note that all communication between myself and you as a student must comply with the electronic communication with student policy ([http://umanitoba.ca/admin/governance/governing_documents/community/electronic communication with students policy.html](http://umanitoba.ca/admin/governance/governing_documents/community/electronic_communication_with_students_policy.html)). You are required to obtain and use your U of M email account for all communication between yourself and the university.

Expectations

Students are expected to attend all class meetings officially designated for the course. They are also expected to read topics in review/research articles assigned to them and make a class presentation, and provide a one-page written critique of the topic. As class discussions are the core components of the course, it is essential that students come well prepared to actively engage.

Student Accessibility Services

If you are a student with a disability, please contact SAS for academic accommodation supports and services such as note-taking, interpreting, assistive technology and exam accommodations. Students who have, or think they may have, a disability (e.g. mental illness, learning, medical, hearing, injury-related, visual) are invited to contact SAS to arrange a confidential consultation.

Student Accessibility Services <http://umanitoba.ca/student-supports/accessibility>

520 University Centre

204 474 7423

Student_accessibility@umanitoba.ca

Description of Examinations

There are no written exams for this course.

Description of Oral Presentation

Oral presentations in the advanced plant physiology course involve review articles, which are published to provide readers with an overview of recent progress in a particular topic by discussing the latest discoveries and summarizing the current state of knowledge. Students pick a topic of their interest covered in review/research papers. To this end, students will pick a review article published preferably after 2018 in a major plant science journal, and submit the titles of the review articles, the authors, and the name of the journal to the instructor at the very beginning of the term. Each presentation will focus on a prominent research article highlighted by the author(s) of the review article, and students are expected to enrich their presentation with more in-depth scientific information from the other related reading materials. In order to better understand the review/research articles, students are also expected to look for relevant background materials from the web or appropriate text books. Presentations will be made using PowerPoint slides. The presenter of each topic is considered as the resource person, thus should be well

prepared to answer any arising questions and lead the class discussions. Each student will cover a different topic in each assigned session.

Searching the Review/Research Articles

A good way to start searching your topic of interest is to use the online databases of the University of Manitoba library at <https://libguides.lib.umanitoba.ca/az.php>. The library has online access to full text review/research articles from a number of journals in the area of plant physiology. Another way to find recent articles is the on-line search engine Web of Science; which is also available through the library. It is recommended that students pick review articles that represent current research questions including recent breakthroughs and controversial issues. Below is a partial list of the prominent journals that publish high impact review/research articles in diverse areas of plant science. Some of the journals in the list are specialized in publishing only review articles, such as the Annual Review of Plant Biology and Trends in Plant Science.

Partial List of Journals Publishing Review/Research Articles

- Annual Review of Plant Biology
- Trends in Plant Science
- Current Opinion in Plant Biology
- Critical Reviews in Plant Sciences
- The Plant Cell
- The Plant Journal
- Plant Physiology
- Plant Cell and Environment

Once you have your topic of interest, it is recommended that you formulate a specific question/hypothesis just like what you do with your thesis project. For example, if you wish to choose my favorite topic “plant hormone”, it is too broad of a topic to be addressed in detail within the time allotted for your presentation. Therefore, you are expected to define the topic not only to a specific hormone but also to a particular aspect of that hormone. An example of such a specific topic could be “auxin biosynthesis and its role in plant development”. In summary, you should focus in picking a topic with enough background material that will make your presentation concise and interesting to the audience. It is always suggested that you consult the abstract of the article of your interest to have a preliminary sense of its content. After having the candidate articles for your topic, you can make use of the following questions to pick an article(s) among your choices.

- Which review paper/research article is in support of answering my question?
- Are there alternative questions/hypotheses in the topic of my interest?
- If so, what are the alternative questions or hypotheses?
- Does the topic address current research questions?
- Is the topic controversial or generally agreed?
- Does the paper represent a recent breakthrough?

Format of Class Presentations

Your presentation should consist of the following:

1. **Introduction:** this section should put the research article in perspective by including background information on the current status of knowledge on the topic and justification for the research. In this section you should answer questions like what is the focus of the article in the context of the review. What are the hypotheses tested or questions answered?
2. **Results and Discussions:** The presenter should focus on significant findings of the research. You should be able to integrate the approaches used with the key finding(s). Results should be presented in graphs and diagrams. In cases when it is impossible to have the results in those formats, you can use a bulleted list. It is important that you discuss what is new about the finding, why it is significant, and how it will advance the current knowledge on the topic.
3. **Conclusions:** In this part of your presentation, you should highlight the main conclusion of the work.
4. **Future Directions:** The presenter should identify the current gap in knowledge of the subject, and the logical next step to fill in that gap.

Presentation Topic Submission Policy

The presenter has to email the title of the article(s), author(s) and name of the journal to the instructor two weeks prior to the presentation date using the following format.

Bomblies K (2010) Doomed Lovers: Mechanisms of Isolation and Incompatibility in Plants. *Annu Rev Plant Biol* **61**: 109-124

Students can access the list of articles to the upcoming presentation at least 10 days before the scheduled date of presentation on UM Learn website (<https://universityofmanitoba.desire2learn.com/d2l/login>).

Description of Assignments

Written critiques of the article(s): the critique should include rationale, major findings of the paper, most important conclusions and your evaluation of the significance of the work. Moreover, you are required to compose two questions from the article(s), which can be used to initiate a discussion in the class, and you should be able to answer those questions concisely by including the key points you want to discuss. The critique (including the two questions) should fit in a single page and be formatted for single line space in 12 point Times New Roman font. In preparing your questions for class discussion, avoid "Yes or No" questions as they halt discussion. You should also avoid too broad questions such as "what do you think about assimilate partitioning?" as they are too open ended. It is recommended that you formulate questions that are open enough to have a few possible right answers, yet closed enough to be approached. For example, you might ask "What are the major physiological mechanisms underlying assimilate translocation in plants?"

Research Proposal: Each student will prepare a two-page research proposal on the topic of their interest. The proposal should include a concise background information, which includes the current state of

knowledge on the topic and significance of the research project, hypothesis and objectives, and the materials and approaches to be employed in the proposed research.

Course Evaluation Methods and Grading Times

I try to get all your work graded within 10 working days after submission/completion. Your final grade will be determined by the following:

Quality of class presentations	25%
Summary/critiques of research articles	25%
Participation in class discussion	20%
Written assignment (Research Proposal)	30%
Total	100%

Grading Scale

Letter Grade	Numerical Scale	Letter Grade	Numerical Scale	Letter Grade	Numerical Scale
A+	≥90 %	B	70-74 %	D	50-56 %
A	80-89 %	C+	65-69 %	F	< 50 %
B+	75-79 %	C	57-64 %		

Assignment Submission Policy

Written critiques of the articles are due in the class on the day of presentation. Missed assignments or assignments not submitted by the due date will receive a zero grade. The research proposal is due on 18 April 2022.

ROASS Schedule “A”

Section (a) sample re: A list of academic supports available to Students, such as the Academic Learning Centre, Libraries, and other supports as may be appropriate:

Writing and Learning Support

The Academic Learning Centre (ALC) offers writing and learning supports to help you throughout your academic program. These supports are offered online during the Covid-19 pandemic.

Make an appointment with an ALC writing tutor who can give you feedback at any stage of the writing process, whether you are just beginning to work on a written assignment or already have a draft. The ALC also has an English as an Additional Language (EAL) specialist available to work with students on improving their English-language academic writing skills.

Consult an ALC learning specialist or attend an academic skills workshop to improve your time management, learning strategies and test-taking strategies. Get support in select courses by making an appointment with an ALC content tutor. The ALC also offers peer-facilitated study groups called Supplemental Instruction (SI) for certain courses that students have typically found difficult. In SI study groups, students ask questions, compare notes, discuss content, solve practice problems, and develop new study strategies in a group-learning format.

In addition to one-to-one and group sessions, you can also find writing and study tip sheets and videos on the ALC website.

Academic Learning Centre services are free for U of M students. For more information, please visit the Academic Learning Centre website at: <http://umanitoba.ca/student/academiclearning/>

Contact the Academic Learning Centre by calling 204-480-1481 or emailing academic_learning@umanitoba.ca. Bannatyne students can contact the Bannatyne Student Services office at 204-272-3190.

University of Manitoba Libraries (UML)

Research begins at [UM Libraries](#). [Learn at the Libraries](#) is a great place to start, with information for students on academic writing, how to search the library, evaluating resources, and writing citations. As the primary contact for all research needs, your [liaison librarian](#) can play a vital role when completing academic papers and assignments. Liaisons can answer questions about locating appropriate resources or managing citations, and will address any other concerns you may have regarding the research process. Liaisons can be contacted by email or phone, and are also available to meet with you online. When working remotely, students can also receive help online through [Ask Us!](#) chat. For further detail about the libraries' services and collections, [visit the Libraries' web site](#). Regularly check our [COVID-19 Update](#) page for available library services and access to resources for Fall 2020

Section (b) sample: re: A statement regarding mental health that includes referral information:

For 24/7 mental health support, contact the Mobile Crisis Service at 204-940-1781.

Student Counselling Centre

Contact SCC if you are concerned about any aspect of your mental health, including anxiety, stress, or depression, or for help with relationships or other life concerns. SCC offers crisis services as well as individual, couple, and group counselling. *Student Counselling Centre*: <http://umanitoba.ca/student/counselling/index.html>

474 UMSU University Centre or S211 Medical Services Building
(204) 474-8592

Student Support Case Management

Contact the Student Support Case Management team if you are concerned about yourself or another student and don't know where to turn. SSCM helps connect students with on and off campus resources, provides safety planning, and offers other supports, including consultation, educational workshops, and referral to the STATIS threat assessment team.

<http://umanitoba.ca/student/case-manager/index.html>

520 UMSU University Centre
(204) 474-7423 (Student Support Intake Assistant)

University Health Service

Contact UHS for any medical concerns, including mental health problems. UHS offers a full range of medical services to students, including psychiatric consultation. Note that due to fire displacement, UHS is unable to provide in-person medical care on the Fort Garry Campus until October, 2020.

University Health Service <http://umanitoba.ca/student/health/>
(204) 474-8411 (Business hours or after hours/urgent calls)

Health and Wellness

Contact our Health and Wellness Educator if you are seeking information on health topics, including physical and mental health concerns, alcohol and substance use harms, or sexual violence. You can also access peer support from a *Healthy U* peer health educator.

Health and Wellness Educator

<https://umanitoba.ca/student/health-wellness/welcome-about.html>
britt.harvey@umanitoba.ca

469 UMSU University Centre
(204) 295-9032

Sexual Violence Resource Centre

Contact SVRC if you have experienced sexual violence or are seeking information about how to help somebody else. SVRC provides inclusive, survivor-centred, trauma-informed services, such as consultation, referrals, safety planning, and a range of on-site supports, including counselling by Clinic.

Sexual Violence Resource Centre

<https://umanitoba.ca/student-supports/sexual-violence-support-and-education>
svrc@umanitoba.ca

537 UMSU University Centre
(204) 474-6562 (Sexual Violence Intake and Triage Specialist)

Student Services at Bannatyne Campus

Contact SS@BC to access a full range of resources and supports for learners at the Rady Faculty

of Health Sciences. Services are provided through a one-stop hub that includes a range of supports for personal and academic success, including counselling, mental health consultation, and spiritual care.

Student Services at Bannatyne Campus

<https://umanitoba.ca/student-supports/student-services-bannatyne-campus>

bcss@umanitoba.ca

S211 Medical Services Building

(204) 272-3190 (Intake and Triage Specialist)

Section (c) sample: re: A notice with respect to copyright:

All students are required to respect copyright as per Canada's *Copyright Act*. Staff and students play a key role in the University's copyright compliance as we balance user rights for educational purposes with the rights of content creators from around the world. The Copyright Office provides copyright resources and support for all members of the University of Manitoba community.

Visit <http://umanitoba.ca/copyright> for more information.

Section (d) sample: re: A statement directing the student to University and Unit policies, procedures, and supplemental information available on-line:

Your rights and responsibilities

As a student of the University of Manitoba you have rights and responsibilities. It is important for you to know what you can expect from the University as a student and to understand what the University expects from you. Become familiar with the policies and procedures of the University and the regulations that are specific to your faculty, college or school.

The [Academic Calendar](http://umanitoba.ca/student/records/academiccalendar.html) <http://umanitoba.ca/student/records/academiccalendar.html> is one important source of information. View the sections *University Policies and Procedures* and *General Academic Regulations*.

While all of the information contained in these two sections is important, the following information is highlighted.

- If you have questions about your grades, talk to your instructor. There is a process for term work and final **grade appeals**. Note that you have the right to access your final examination scripts. See the Registrar's Office website for more information including appeal deadline dates and the appeal form <http://umanitoba.ca/registrar/>
- You are expected to view the General Academic Regulation section within the Academic Calendar and specifically read the **Academic Integrity** regulation. Consult the course syllabus or ask your instructor for additional information about demonstrating academic integrity in your academic work. Visit the Academic Integrity Site for tools and support <http://umanitoba.ca/academicintegrity/> View the **Student Academic Misconduct** procedure for more information.
- The University is committed to a respectful work and learning environment. You have the right to be treated with respect and you are expected to conduct yourself in an appropriate respectful manner. Policies governing behavior include the:

Respectful Work and Learning Environment

http://umanitoba.ca/admin/governance/governing_documents/community/230.html

Student Discipline

http://umanitoba.ca/admin/governance/governing_documents/students/student_discipline.html and,

Violent or Threatening Behaviour

http://umanitoba.ca/admin/governance/governing_documents/community/669.html

- If you experience **Sexual Assault** or know a member of the University community who has, it is important to know there is a policy that provides information about the supports available to those who disclose and outlines a process for reporting. The **Sexual Assault** policy may be found at: http://umanitoba.ca/admin/governance/governing_documents/community/230.html More information and resources can be found by reviewing the Sexual Assault site <http://umanitoba.ca/student/sexual-assault/>

For information about rights and responsibilities regarding **Intellectual Property** view the policy: https://umanitoba.ca/admin/governance/governing_documents/community/235.html

For information on regulations that are specific to your academic program, read the section in the Academic Calendar and on the respective faculty/college/school web site <http://umanitoba.ca/faculties/>

Contact an **Academic Advisor** within our faculty/college or school for questions about your academic program and regulations <http://umanitoba.ca/academic-advisors/>

Student Advocacy

Contact Student Advocacy if you want to know more about your rights and responsibilities as a student, have questions about policies and procedures, and/or want support in dealing with academic or discipline concerns.

<http://umanitoba.ca/student/advocacy/>

520 University Centre

204 474 7423

student_advocacy@umanitoba.ca