Plant Growth and Development
BIOL 3243/3240L

Instructor: Jen Kershaw (she/her)
Hear my name
Office: BIO 431
Office hours: by apt. in-person or Teams
E-mail: jennifer.kershaw@acadiau.ca

Lecture: M/W/F, Huggins Science Hall 143, 11:30 AM - 12:20 PM

Lab: BIO 210
WI01: F 1:00 PM - 3:50 PM
Jan 17 & 31, Feb 14, Mar 7, & 21

ACADIA BIOLOGY

Evaluation	Percentage	Date
Practice	30	Practice & reflection activities (before, during & after class)
Lab	35	Lab activities due throughout term
Mid-term	15	In class Feb 24th, 2024
Final reflection	5	Apr 6, 2024
Final Exam	15	TBD, during the exam period

No classes/labs	Feb 17- 21 Heritage Day & winter study break

Part 1: Course Information

Course Description

The factors and mechanisms involved in the regulation of plant growth and development. Topics include phytohormones, differential growth responses, dormancy, photomorphogenesis and photoperiodism.

Prerequisite(s): BIOL 2013 and BIOL 2043 with minimum grades of C-, or permission of department

Course Materials & Requirements

Plant Biology (free pdf available on the course Moodle site)
Access to Moodle and a computer or tablet to take online quizzes and tests (please let instructor know if this is an issue)

Course Structure

This course has both an in-class (lecture) component and a bi-weekly lab. During class time there will be activities, case studies, and journal discussions, not just lecturing. The in-class activities are worth 30% of your grade, so, though I will record lectures for your reference, plan to attend class and participate. I recognize not everyone likes to talk in a big group, so participation opportunities will take many forms.

Student Learning Outcomes

1. Understand how plants access, transport, and use water, nutrients, and sunlight to grow and develop
2. Understand alternative strategies plants may have for achieving their nutritional requirement such as carnivory and mutualisms
3. Understand the functions of plant growth regulators (phytohormones)
4. Understand plant growth and development including embryogenesis, dormancy, germination, and flowering
5. Understand how plant interactions with other organisms can affect their growth and development

How to Meet the Learning Outcomes

1. Attend lectures, take notes, and participate in class activities
2. Keep up with materials and activities posted for each unit on Moodle
3. Test yourself on the material on a regular basis
4. Print and read lab handouts in advance, participate in lab activities and complete lab assignments

Part 2: Course Plan

The instructor reserves the right to amend the course plan with reasonable notice, and in consultation with the class.

Lecture Topics:

1. Introduction to Course
2. Cuticle & stomata
3. Light & photoreceptors
4. Plant water relations & xylem
5. Phloem
6. Photosynthesis
7. Respiration
8. Plant nutrition
9. Plant intelligence (perception, interaction & plant growth regulators)
10. Plant interactions with others

All Power point slide sets will be available on the class Moodle site

Lab Topics:

1. Tissue culture
2. Cuticle & stomata
3. Light
4. Phytochrome
5. Plant growth regulators

Part 3: Assessment and Grading

The course grade will be made up of: 30% for practice and reflection activities (in and out of class), 35% for laboratory assignments, 15% for a mid-term held in class on February 24th, 5% for a final reflection, and 15% for an exam during the winter exam period (date TBD).

For all biology courses where there is a lab, you are required to pass the lab to pass the course.

Part 4: Course Policies

I want all students to be successful in this course, so please let me know when you are having any difficulties. There are many circumstances that may arise over the course of the term that could impact your studies, just let me know and we will find a solution together.

Attendance: If you are feeling unwell, please stay home and take the time to recuperate. You can join the class from home via the Teams link. I can also provide you with alternate ways to participate in the class activities that you have missed and the lecture component recording will be available on the Moodle class page.

Labs: If you are sick or must miss a lab for another reason, let me know as soon as you can, and we will make arrangements so that you can complete the lab assignments. Please take the time review the lab handout before lab and print it out if you would like a paper copy to work through (you can also submit your work digitally).

AI: You may use generative artificial intelligence tools (e.g., ChatGPT, Gemini, Claude, etc.) for learning and practicing the concepts in this course, but these tools may NOT be used for completing assignments and

assessments in this course (including the prewriting and editing stages). The rationale for this and examples will be provided in the class.

Part 5: University Policies

University policies are available in the Acadia University Academic Calendar or through the Registrar's website: https://registrar.acadiau.ca/welcometotheregistrarsoffice.html

Equity, Diversity and Inclusion

Acadia University is committed to becoming a culturally safe and anti-oppressive community. This can only be achieved where there are simultaneous efforts to eliminate all forms of discrimination and harassment from our campus community, including the elimination of all discrimination, harassment and violence based on one's identity, including but not limited to, gender, race, class, ethnicity, sexual orientation, disability, gender identity, gender expression, and Indigeneity. The policy against harassment and discrimination, and resources for students who believe they may have experienced, or witnessed, discrimination or harassment, are available here: https://www2.acadiau.ca/student-life/equity-judicial/equity.html

Last Drop Day

Last day to drop a course and receive a "W". Please check the Acadia University calendar dates, which are available here: https://registrar.acadiau.ca/AcademicCalendars.html

Inform Your Instructor of Accommodations

Acadia University is dedicated to improving access to campus life for all students with disabilities. While we attempt to ensure that all courses are accessible, we recognize that there are barriers that need to be addressed on an individual basis. Students who require accommodations to complete coursework or otherwise fully participate in class should contact Accessible Learning Services directly as soon as possible. https://www2.acadiau.ca/student-life/accessiblelearning.html

The Use of Animals in Teaching and Research

The use of animals in teaching and research at Acadia University is done in accordance with guidelines on the care and use of animals published by the Canadian Council on Animal Care (CCAC). For more information on the CCAC, please visit their website at http://www.ccac.ca

Commitment to Integrity

It is standard practice in Biology to check exams and assignments for cheating and plagiarism. Cheating in the class and/or lab, including plagiarism, will not be tolerated. Please read the appropriate sections of the current Acadia University Academic Calendar: https://registrar.acadiau.ca/AcademicCalendars.html

Information on copy-write and course content from Acadia University is available through the Vaughan Memorial Library: http://libguides.acadiau.ca/c.php?g=433650&p=5027078

The spoken and written course content (including the syllabus, handouts, lectures, presentations, labs, assignments, quizzes, tests, and exams) are the intellectual property of the instructor and may only be copied for personal use. Sharing these materials or uploading them where they may be accessed by others is a violation of copyright. If you wish to make audio, video, or photographic recordings in class, you must first obtain the consent of the instructor and of any other persons (e.g., guest speakers, other students) who may be captured in such recordings. The instructor's consent shall not be unreasonably withheld.

Use of artificial intelligence tools by students to assist with their learning is allowed only if: prior permission has been given by the course professor/instructor, and the student properly credits/cites how the AI technology was used in their work. AI must be used in an ethical and responsible manner as a positive learning tool. AI may not be used in ways that violate Acadia's Academic Integrity Policy. Students are reminded that plagiarism, or other forms of cheating, are both types of academic dishonesty.

Share the Air Policy

Acadia is a scent-free and smoke-free campus. Everyone on campus should refrain from wearing scented products such as perfume/cologne/after-shave/hair spray etc. Violation of this policy could lead to your removal from class/lab/tutorial. https://hr.acadiau.ca/employment/university-policies.html

Part 6: Program Learning Outcomes

Foundations of knowledge		**Course specific examples**	**Proficiency** 1-Introduction 2-Reinforcement 3-Proficient
Scientific method, inquiry and hypothesis testing	Find, understand and apply information from the literature; understand how to use the scientific method to examine problems from different perspectives	Conduct experiments to demonstrate how principles were established (roles of plant growth regulators, impact of light variables on development, ect.)	2
Historical concepts and contributions by important figures	Explain foundational concepts in biology, Two-eyed Seeing, and ethical implications of scientific discoveries	Human context advancement of scientific (e.g., Endosymbiosis, RuBisCO, plant "intelligence")	2
Biodiversity and ecology	Understand the genetic, taxonomic and ecosystem levels of biodiversity; focus on SW Nova including the Acadian Forest and Bay of Fundy ecosystems	Physiology and anatomical diversity, genetic control of diversity of flower expression, examination of local species	2
Genetics and evolution	Understand the chemical basis of heredity, genetics and genomics; integrate concepts across disciplines to understand evolution	Modification of gene expression based on intra and interspecies interaction	2
Human and environmental health	Understand form and function in health and disease within a One Health framework, integrating human and environmental health		
Lab and field skills			
Experimental design	Gain experience in applying the scientific method	Multiple experiments	2
Safety	Work safely and productively in lab and field settings	Basic lab safety protocols	2
Lab skills	Gain experience with basic and advanced lab techniques and understand their application in research, health science and industry	Microscopy, serial dilution, pipette, use of light meters, sterilization, tissue culture	2
Field skills	Gain experience in basic and advanced field skills and understand their application in ecology, conservation biology and environmental change		
Data acquisition, analysis and interpretations	Collect data, present results both qualitatively and quantitatively, and interpret outcomes in light of the literature	Data collection, analysis and discussion (referencing literature)	2
Statistical analysis	Use R and or other programs to analyze biological data	Use of Excel to conduct analyses	2
Professional skills			
Ethical practices	Demonstrate ethical conduct, apply principles of academic integrity, and understand the principles of EDI in science	Respectful participation, proper citation, professional email and other communication	3
Collaboration and group work	Work effectively in groups within and across disciplines	Discussion groups, case studies, lab partners and review work	3
Critical thinking	Analyze and evaluate information to make science-based decisions	Discussion, experiment and class reflection questions	3

Computer proficiency	Use common and discipline- specific software	Use of Excel for analyses, and to produce figures and tables	2
Scientific communication	Communicate science effectively to both scientific and general audiences	Group discussions, written responses to prompts	2