BIOL 2043/2040L Biodiversity of Plants and Algae

Instructor: Dr. Zoe Panchen
Office: BIO 430
Office hours: M/W 5:30-6pm or by apt.
E-mail: zoe.panchen@acadiau.ca
Lecture: M/W BAC 244, 4-5:20 pm

Lab 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
Lab: BIO 210
FA01 W 1-3:50 pm (Sep 18, Oct 2 & 23, Nov 6 & 20)
FA02 Th 8:30-11:20 am (Sep 19, Oct 3 & 24, Nov 7 & 21)
FA03 Th 1-3:50 pm (Sep 19, Oct 3 & 24, Nov 7 & 21)
FA04 F 1-3:50 pm (Sep 20; Oct 4, 25; Nov 8 & 22)

We're here to help and facilitate your learning! If you have questions or concerns, please drop by our offices during office hours or by making an appointment. To make an appointment please send an email with days and times you are available and briefly what you would like to discuss. You can also email questions.

Emergency communication plans: if there is a class/lab cancellations or classes/labs need to move on-line, we will send an email to all students via ACORN at least 2 hours before the start of the class/lab with a Teams link for an on-line class/lab.

Evaluation	Percentage	Date
Practice	20%	Practice and reflection (before, during, after class)
Tests	30%	3 tests (10% each), in class on 25th Sept., 23rd Oct., 13th Nov.
Lab	35%	Scavenger Hunt: 5%, Lab Activities: 20%, Lab Report: 10% (due Nov 18)
Final exam	10%	Exam week

No classes/labs	Sept 30, 2024 (National Day for Truth and Reconciliation observed) Oct 14, 2024 (Thanksgiving) Oct 15-18, 2024 (Fall Study Break) Nov 11 (Remembrance Day)

Part 1: Course Information

Course Description

An introduction to the structure, function, evolution and diversity of plants and algae
Prerequisite(s): BIOL 1113/1123 with at least a C- (60%) in each, or permission of the instructor

Course Materials & Requirements

Plant Biology (free pdf available on the course ACORN site). Students are expected to read the relevant chapters to compliment what is presented in the lectures and practiced in the lab.
Access to ACORN and a computer or tablet to take online quizzes and tests (please let instructor know if this is an issue)

Course Structure

Lecture material will be presented in 1hr 20min lecture slots. Lecture time will be used for activities, discussion, and instruction. Attendance is strongly encouraged.
There will be 5 labs on alternate weeks starting 18th Sept. Labs are mandatory and complement the lectures by providing opportunities for experiential learning.

Student Learning Outcomes

1. Understand seed morphology, anatomy, and physiology of seed germination

2. Understand growth and development of above ground and below ground tissues and organs
3. Understand the anatomy and physiology of how plants grow and survive under different conditions
4. Understand the development of reproductive structures and their role in plant reproductive biology

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 ACORN
3. Read the relevant chapters of the course text and read other scientific papers or books on the subject
4. Test yourself on the material on a regular basis
5. Print and read lab handouts in advance, participate in lab activities and complete lab assignments

Part 2: Topic Outline/Schedule

Lecture:

Unit 1: Introduction to plant biodiversity
Unit 2: Flowers
Unit 3: Fruits
Unit 4: Seeds, germination, & early growth
Unit 5: Plant cells
Unit 6: Plant tissues, organs, & organ systems
Unit 7: Root anatomy, morphology & symbioses
Unit 8: Plant-fungal interactions
Unit 9: Vascular tissues (xylem & phloem)
Unit 10: Secondary growth
Unit 11: Leaf anatomy & photosynthesis
Unit 12: Plant water relations
Unit 13: Bryophytes and pteridophytes
Unit 14: Algae and Lichens
Unit 15: Biodiversity survey

Lab:

Lab 1: Angiosperm flowers, pollination, & seed development
Lab 2: Angiosperm fruit, seeds, seedlings, & shoots
Lab 3: Angiosperm roots & plant extract antimicrobial properties experiment
Lab 4: Gymnosperm & angiosperm secondary growth, leaf anatomy & photosynthetic pigment extraction
Lab 5: Plant water relations

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

Part 3: Assessment and Grading

The assessment schedule is listed at the beginning of the syllabus. Each test will be delivered on ACORN and completed by each student, separately during lecture time. Appropriate accommodations will be made for any student who might require them; please contact Accessibility Services to make sure you are getting the supports set up that you need.

Makeup tests will not be given. If you are sick, or have other valid reasons for missing a test, the weight from the missed test will automatically be distributed among the completed tests.

I encourage you to come talk to me if you have concerns about completing class work. We are happy to meet with you in person or via Teams, there is help available at the free weekly Bio Help Centre. We encourage you to keep to the assigned deadlines so that you can keep up, but understand that there can be extenuating circumstances.

You are required to pass the lab in order to pass the course.

Part 4: Course Policies

All materials covered in lecture, information from the textbook and information from guest speakers may be included in the tests and final exam. Thus, in-person attendance is strongly encouraged.

Lab activities are designed to reinforce class content. If you are sick or otherwise unable to come to the lab, please contact me as soon as possible so that we can make alternate arrangements. **Attendance in person for the labs is mandatory**. If you must miss a lab, please contact Jennifer Kershaw in advance.

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

If you are feeling stressed (and tempted to use an unauthorized aid or someone else's work), contact me for an extension and/or support.

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. In the case of personal use by students with disabilities, the instructor's consent shall not be unreasonably withheld.

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	Process of discovering the role of green light in photosynthesis, interpretation and discussion of data figures from literature	1
Historical concepts and contributions by important figures	Explain foundational concepts in biology, Two-eyed Seeing, and ethical implications of scientific discoveries	Key discoveries in botany, who has (and who has not) won Nobel prize awards, ethics of GMO plants	1
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	Investigate the diverse modifications of plant tissues and organs, and their adaptive function in different environments	1
Genetics and evolution	Understand the chemical basis of heredity, genetics and genomics; integrate concepts across disciplines to understand evolution	Roles of vertical and horizontal gene transfer in plant evolution	1
Human and environmental health	Understand form and function in health and disease within a One Health framework, integrating human and environmental health	Plant roles in ecosystem function, primary production, CO_2 fixation, impact of changing climate on plant processes	1
Lab and field skills			
Experimental design	Gain experience in applying the scientific method.	Controls, conducting an experiment, data collection	1
Safety	Work safely and productively in lab and field settings	Basic lab safety protocols	1
Lab skills	Gain experience with basic and advanced lab techniques and understand their application in research, health science and industry	Use of compound and dissecting scopes, slide preparation, examination of live material and prepared slides, plant dissection	1
Field skills	Gain experience in basic and advanced field skills and understand their application in ecology, conservation biology and environmental change	Field identification of patterns and terms learned in class and lab; data collection with iNaturalist	1
Data acquisition, analysis and interpretations	Collect data, present results both qualitatively and quantitatively, and interpret outcomes in light of the literature	Analysis of figures	2
Statistical analysis	Use R and or other programs to analyze biological data		
Professional skills			
Ethical practices	Demonstrate ethical conduct, apply principles of academic integrity and understand the principles of EDI in science	Respectful participation in class and lab, proper citation, professional email and other communication	1
Collaboration and group work	Work effectively in groups within and across disciplines	Group collaboration in class and lab activities such as small group	1

		discussions, case studies, lab partners and review work	
Critical thinking	Analyze and evaluate information to make science-based decisions	Question response, discussions, experiment reflection questions, lab observation reflection questions	1
Computer proficiency	Use common and discipline- specific software		
Scientific communication	Communicate science effectively to both scientific and general audiences	Lab and class small group discussions, written hand-ins, in-class written responses to prompts	2