

****DRAFT, SUBJECT TO CHANGE****
University of Guelph
College of Biological Science
Department of Integrative Biology

COURSE OUTLINE
Plant Diversity and Evolution (BOT*3710)
Winter 2018

Course Goal

This course will provide an introduction to the identification and interpretation of plant biodiversity. Students will explore the taxonomic diversity of flowering plants and investigate evolutionary hypotheses to explain variation in their reproductive, life history and growth characteristics. The principles and methods of evolutionary biology will form the underlying framework for the course. The course will be of value to students interested in biodiversity, the practical aspects of identifying plants, and understanding the variety of forms and life-styles observed among plants. (prerequisites: 7.5 credits including BIOL*1040 or 1070)

Teaching Team

Professor: Christina Caruso, SSC 1471, carusoc@uoguelph.ca, ext. 52030

Office hours: 9:00-10:30 T, 10:30-12:00 Th

Lab Instructor: Carole Ann Lacroix, SSC 2507, botcal@uoguelph.ca, ext. 56444

Office hours: by appointment

Teaching Assistant: TBA

Course Schedule

Lectures 1:00–2:20 Tuesday & Thursday, CRSC 116 (note: some Thursday lecture periods will be used as labs. Please check the schedule below)

Labs 2:30-5:20 Thursday, SSC 3315

Learning Outcomes

By the end of this course, students should be able to:

- 1) Recognize the major families of flowering plants in Ontario and their distinguishing morphological/ecological attributes.
- 2) Identify the major flowering plant families using taxonomic keys.
- 3) Identify select genera and species using taxonomic keys.
- 4) Interpret the evolutionary history of plants through an examination of phylogenetic trees.
- 5) Critically evaluate empirical evidence that tests hypotheses for the evolution of key vegetative, reproductive and genetic attributes of plants.
- 6) Interpret the patterns and causes of trait evolution in plants using phylogenetic information and comparative analytical software.

Course Resources

Textbook: For lectures: There is no required text. Any assigned readings will be posted to Courselink. For labs: Field Manual of the Michigan Flora, Voss E.G. & A.A. Reznicek, Cranbrook Institute of Science is available in the UofG Bookstore and Coop Bookstore.

Courselink: This course will make use of the University of Guelph's course website on D2L (via Courselink). Consequently, you are responsible for all information posted on the Courselink page for BOT*3710. Please check it regularly.

Course Structure

The course is organized according to the philosophy that we learn best about biodiversity by: 1st, learning to recognize and identify different groups of plants; 2nd, observing character variation within and between these groups and; 3rd, interpreting this diversity by investigating the evolutionary causes of variation through comparative approaches. As a result, the course emphasizes classification and identification in the early stage and evolutionary interpretation in the latter stage.

Lecture periods

Lecture periods will be used for (1) team quizzes on the characteristics of the plant families that you are learning to identify in during lab periods and (2) team activities on how to use phylogenetic trees to test hypotheses about flowering plant evolution. Although class materials will be posted on Courselink, they are not a substitute for coming to lecture and participating in class activities.

Lab periods

Nine weeks of lab periods will focus on learning the characteristics and associated terminology of some of the most common, important, and interesting families of flowering plants. You will apply this knowledge to use professional taxonomic keys to identify vascular plants. Learning family characteristics, by allowing you to group related species together, makes it much easier to identify plants. The remaining lab periods will focus on designing and collecting data for a final group project using phylogenetic trees to test hypotheses about flowering plant evolution.

Note on teamwork: Throughout the semester, you will be working with a team of 4-6 other students to complete team quizzes during lecture periods, complete team assignments during lecture periods, and complete a final phylogenetic analysis project. We are incorporating teamwork into the class because one of the best ways to learn is to explain your thinking to others, and because on average teams produce higher-quality work than any one individual does. Further information on how teams will be assembled will be provided in class and via email.

Tentative Lecture and Lab Schedule (note that some Thursday lecture periods will be used for labs)

Week	Date	Lecture Topic (Tues,Thurs)	Lab Topic (Thurs)
1	Jan 9	Introduction to class Fill out team questionnaire	
1	Jan 11	No lecture; lab starts at 1 pm in the scheduled lab room	Classification & Identification; Morphology and use of keys: Magnoliaceae, Ranunculaceae
2	Jan 16	Write team contract In-class team assignment #1: Introduction to phylogenetic trees	
2	Jan 18	In-class team quiz on morphology, Magnoliaceae, and Ranunculaceae Lab starts at 1:45 pm in the scheduled lab room	Classification & Identification: Caryophyllaceae, Papaveraceae, Brassicaceae
3	Jan 23	In-class team assignment #2: Interpretation of phylogenetic trees	
3	Jan 25	In-class team quiz on Caryophyllaceae, Papaveraceae, and Brassicaceae Lab starts at 1:45 pm in the scheduled lab room	Classification & Identification: Fabaceae, Rosaceae, Apiaceae (PLANT IDENTIFICATION-LAB QUIZ #1)
4	Jan 30	In-class team assignment #3: Using phylogenetic trees to test hypotheses, Example 1	
4	Feb 1	In-class team quiz on Fabaceae, Rosaceae, and Apiaceae Lab starts at 1:45 pm in the scheduled lab room	Classification & Identification: Euphorbiaceae, Boraginaceae, Lamiaceae, Onagraceae
5	Feb 6	In-class team assignment #4: Using phylogenetic trees to test hypotheses, Example 2	
5	Feb 8	In-class team quiz on Euphorbiaceae, Boraginaceae, Lamiaceae, and Onagraceae Lab starts at 1:45 pm in the scheduled lab room	Classification & Identification: Caprifoliaceae, Apocynaceae, Asteraceae (PLANT IDENTIFICATION-LAB QUIZ #2)
6	Feb 13	In-class team assignment #5: Using phylogenetic trees to test hypotheses, Example 3	
6	Feb 15	In-class team quiz on Caprifoliaceae, Apocynaceae, and Asteraceae Lab starts at 1:45 pm in the scheduled lab room	Classification & Identification: Iridaceae, Liliaceae, Juncaceae
Winter Break	Feb 19-23	NO LECTURES	NO LAB

Week	Date	Lecture Topic (Tues,Thurs)	Lab Topic (Thurs)
7	Feb 27	In-class team assignment #6: Using phylogenetic trees to test hypotheses, Example 4	
7	Mar 1	In-class team quiz on Iridaceae, Liliaceae, and Juncaceae Lab starts at 1:45 pm in the scheduled lab room	Classification & Identification: Cyperaceae, Poaceae,- Part 1 (PLANT IDENTIFICATION-LAB QUIZ #3)
8	Mar 6	In-class team poster assignment	
8	Mar 8	In-class team quiz on Poaceae and Cyperaceae Lab starts at 1:45 pm in the scheduled lab room	Classification & Identification: Poaceae,- Part 2
9	Mar 13	In-class team assignment #7: Poster presentation	
9	Mar 15	No lecture; lab starts at 1pm in the scheduled lab room	PLANT IDENTIFICATION – LAB EXAM
10	Mar 20	Final phylogenetic analysis project: Planning session	
10	Mar 22	No lecture; lab starts at 1pm in the scheduled lab room	Final phylogenetic analysis project: Team meetings with Prof. C and drop-in help session
11	Mar 27	Final phylogenetic analysis project: Drop-in help session	
11	Mar 29	No lecture; lab starts at 1pm in the scheduled lab room	Final phylogenetic analysis project: Team meetings with Prof. C and drop-in help session
12	Apr 3	Final phylogenetic analysis project: In-class peer review of poster drafts	
12	Apr 5	No lecture; lab starts at 1pm in the scheduled lab room	Final phylogenetic analysis project: Drop-in help session

Methods of Assessment

Assessment	Value (% of final grade)	Date	Learning Outcome (see above)	Course activity
Plant identification lab quizzes (individual grade)	Best 2 of 3 2 x 6% = 12%	Jan 25 Feb 8 March 1	1, 2, 3 1, 2, 3 1, 2, 3	Lab, weeks 1-2 Lab, weeks 1-4 Lab, weeks 1-7
Plant identification lab exam (individual grade)	30%	Mar 5	1, 2, 3	Lab, weeks 1-9
In-class team quizzes (mean of individual and group grades)	Best 5 of 7 5 x 1% = 5%	Jan 18 Jan 25 Feb 1 Feb 8 Feb 15 Mar 1 Mar 8	1,2,3	Lec, weeks 2-8
In-class team assignments (group grade)	7 x 3% = 21%	Jan 16 Jan 23 Jan 30 Feb 6 Feb 13 Feb 27 Mar 6&13	4, 5, 6	Lec, weeks 2-9
Poster on final phylogenetic analysis project (group grade)	15%	Final version due Apr 6 by 5:00 PM	4, 5, 6	Lec, weeks 10-12 Lab, weeks 10-12
Peer feedback of drafts of final phylogenetic analysis poster (individual grade)	2%	In lecture on April 3	4, 5, 6	Lec, week 12
Take-home final exam (individual grade)	15%	Due Apr 15 by 5:00 PM	4, 5, 6	Lec, weeks 1-12 Lab, weeks 10-12

Grades will be assigned according to the standards outlined in the U of G Undergraduate Calendar.

Description of Assessment

Plant identification lab quizzes and exam: Your ability to identify plant specimens using a professional key will be assessed through three lab quizzes and a lab exam.

In-class team quizzes: Research indicates that frequent, low-stakes quizzing improves performance by making you aware of what you do not know well in advance of the exam. Consequently, prior to seven of the plant ID labs, you will complete a quiz on plant morphology and family characteristics. You will first complete the quiz on your own, and then complete the same quiz with your team.

In-class team assignments: In seven of the lecture periods, you will work with your team members on assignments. Six of these assignments are designed to help you learn about phylogenetic trees and how they can be used to test hypotheses about flowering plant evolution. One assignment is designed to help you learn how to do a poster presentation.

Poster on final phylogenetic analysis project: During the last 3 weeks of labs and lectures, you will work with your team on a final phylogenetic analysis project. Your team will be expected to choose a question, identify a group of plants to use for the study, collect data from the literature, analyze the data using the methods learned through the in-class team assignments, and complete a poster describing the results.

Peer feedback on the final phylogenetic analysis poster: In lecture on April 3rd, you will provide peer feedback on other teams' poster drafts.

Take-home final exam: For the take-home final exam, you will complete a poster describing the results of the analyses from take-home assignment 3, 4, 5, or 6.

Important Dates

JAN 9 (Tues): First lecture in BOT*3710, 1:00 pm

JAN 25 (Thurs): First lab quiz

FEB 8 (Thurs): Second lab quiz

FEB 19-23 (Mon – Fri): Winter break: NO CLASSES

MAR 1 (Thurs): Third lab quiz

MAR 15 (Thurs): Plant identification – lab exam

MAR 9 (Fri): Course drop deadline (40th class day)

APR 6 (Fri): Poster on final phylogenetic analysis project due (by 5:00 PM in Dropbox)

APR 15 (Sun): Final take-home exam due (by 5:00 PM in Dropbox)

Course & University Policies

When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact, and be prepared to provide supporting documentation. See the Undergraduate Calendar for information on regulations and procedures for Academic Consideration

Policy for Re-grading of Exams and Assignments

Students who wish to have their exam or assignments re-graded must submit their exam or assignment within 1 week of the return of the exam or assignment. The entire exam or assignment will be re-graded so the mark may go up, down or remain unchanged.

Accessibility

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact the [Student Accessibility Services \(SAS\)](#) (formerly the Centre for Students with Disabilities) as soon as possible.

For more information, contact SAS at 519-824-4120 ext. 56208 or email sas@uoguelph.ca.

Academic Misconduct

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community – faculty, staff, and students – to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

The [Academic Misconduct Policy](#) is detailed in the Undergraduate Calendar.

E-mail Communication

As per university regulations, all students are required to check their <uoguelph.ca> e-mail account regularly: e-mail is the official route of communication between the University and its students.

Drop Date

The last date to drop one-semester Winter 2018 courses, without academic penalty, is **Friday March 19**. For [regulations and procedures for Dropping Courses](#), see the Undergraduate Calendar.

Copies of out-of-class assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

Recording of Materials

Presentations which are made in relation to course work—including lectures—cannot be recorded in any electronic media without the permission of the presenter, whether the instructor, a classmate or guest lecturer.

Grading

If you are absent from classes during the semester, you will be expected to make up missed lecture and laboratory material on your own. An assignment handed in late will be penalized 5% for every day that it is late.

General Campus Resources

If you are concerned about any aspect of your academic program:

Make an appointment with a [Program Counsellor](#) in your degree program.

If you are struggling to succeed academically:

There are numerous academic resources offered by the [Learning Commons](#) including, Supported Learning Groups for a variety of courses, workshops related to time management, taking multiple choice exams, and general study skills. You can also set up individualized appointments with a learning specialist.

If you are struggling with personal or health issues:

[Counselling services](#) offers individualized appointments to help students work through personal struggles that may be impacting their academic performance. [Student Health Services](#) is located on campus and is available to provide medical attention. For support related to stress and anxiety, besides Health Services and Counselling Services, [Kathy Somers](#) runs training workshops and one-on-one sessions related to stress management and high performance situations.

If you have a documented disability or think you may have a disability:

Student Accessibility Services (SAS) formerly Centre for Students with Disabilities (CSD) can provide services and support for students with a documented learning or physical disability. They can also provide information about how to be tested for a learning disability. For more information, including how to register with the centre please see visit the [SAS website](#).

Additional Course Information

We expect you to

- take responsibility for your own learning
- prepare for and attend class and lab regularly
- participate enthusiastically in class activities and labs
- set high standards for your performance in the course
- treat others in the course respectfully
- turn in work on time
- stay informed about course information distributed online
- maintain academic integrity

You can expect us to

- help you become a better learner
- create interesting and challenging ways for you to learn about plant diversity and evolution
- set high standards for the class
- treat you with fairness and respect
- promptly respond to your questions and concerns about the course
- take an interest in your development as a botanist

- be excited and knowledgeable about the course material
- grade and hand back your work promptly