BIO150
Plant Ecology/Field Botany
Draft Course Syllabus
Term Year

Class Location & Time	Tue, 9:00 AM – 10:15 AM (Lecture) Thu, 9:00 AM – 10:15 AM (Lecture) Fri, 1:00 PM – 4:00 PM (Lab)
Instructor	David Murray-Stoker
Office Location	DV2014
Office Hours	Mon/Wed, 11:00 AM – 1:00 PM Tue/Thu, 1:00 PM – 3:00 PM
E-mail Address	d.stoker@mail.utoronto.ca
Course Web Site	TBD

Course Overview
Introduction to the biology and ecology of plants, with a particular focus on the plants of Georgia, USA. Students will learn the foundations of plant biology and physiology and use that knowledge as to compare and contrast the diversity of plant life. Lecture topics include: molecules of plant life, structure and function of plant cells and membranes, respiration and photosynthesis, plant growth, plant-microbe interactions, and plant reproduction. Labs will involve: survey of plants on campus, tours of plants from different ecoregions in the greenhouse, experiments between plants, bacteria, and fungi, comparisons of flower structure and seed morphologies, and quantifying and comparing herbivory. Students will use what they learn from the lecture, lab, and field to map plant diversity.

Prerequisites: TBD

Learning Objectives
As you participate and engage in the course, you will be able to:
- Build a strong foundation in plant biology and physiology.
- Evaluate the diversity of plant life across different ecoregions.
- Link plant diversity to environmental context and broader ecological processes.
- Develop essential lab and field skills for biologically-focused research.
- Conduct a scientific experiment in the lab.
- Synthesize your learning of plant diversity through a Botany Map.

Course Instructors
Primary Instructor: David Murray-Stoker, Ph.D. Candidate (he/they)
Email: d.stoker@mail.utoronto.ca
Office Location: DV2014

Student Hours
Join your instructor and your peers to discuss material being covered in class, raise any questions or concerns you might have, and any other topics that will help you and your learning in the course. You are welcome to join these student hours even if you do not have a question, as listening to the conversation can still be helpful (and might raise a question for you to ask).

Mon/Wed, 11:00 AM – 1:00 PM
Tue/Thu, 1:00 PM – 3:00 PM

If these times do not work with your schedule, please email me so we can arrange a time.

Course Resources
Required Readings
Chapter readings will be uploaded to the course website at the start of the term. **Reading the posted chapters before attending and engaging in class is essential.** You will also require this book for the course:

Edwards, L., J. Ambrose, and L. K. Kirkman. 2013. The Natural Communities of Georgia. University of Georgia Press. ISBN: 9780820330211

Supplemental Readings
Additionally, for the lab component of the course these books will be helpful resources:

Kricher, J., and G. Morrison. 1998. A Field Guide to Eastern Forests. Peterson Field Guide Series. ISBN: 9780395928950
Thieret, J. W., W. A. Niering, and N. C. Olmstead. National Audubon Guide to Wildflowers Eastern Region. National Audubon Society. ISBN: 9780375402326

Technology
You will need access to a device (e.g., laptop, tablet) with internet access for lecture activities, email correspondence, using the course website, and completing assignments. You will also require access to an iClicker. You are also encouraged to use a laptop or equivalent device with Microsoft Office installed (software subscription included with your university email) or use Google Docs to complete the coursework (described below). Students may also borrow laptops from the UTM library. **If you do not have reliable access to the internet and/or a suitable device, please contact me so we can find a positive solution.**

Teaching Methods
BIO150 is an active learning class where you are part of the learning process. You are therefore expected to come to lecture and lab ready to engage in the material, ask questions, participate in activities, and collaborate with your peers.

Coursework
You should expect to complete 10-12 hours of study and work each week for this course, including time spent in lecture and lab. In other words, there will be ~4-6 hours of work outside of lectures and computer labs for you to complete the readings and course assignments. The course schedule is at the end of the syllabus, but the table below highlights the assignments and their weight towards your final grade.

Type	Description	Due Date	Weight
Lecture Quizzes	In-class lecture quizzes and activities	Ongoing	10%
Lecture Reflections	Directed reflections (5 total)	TBD	15%
Laboratory Assignments	Participation and engagement in lab activities	TBD	20%
Term Test 1	Take-home term test (weeks 1-7)	TBD	15%
Term Test 2	Take-home term test (weeks 8-15)	TBD	15%
Botany Map	Synthesis assignment to compare and contrast observed plant diversity and the environmental contexts in which they occur.	TBD	25%
		Total	100%

Notes on Coursework
Lecture Quizzes: We will use lecture quizzes to document progress through the learning process. Quizzes be evaluated for completeness – not correctness – and there will be the opportunity to learn the 'correct' answer in class, either from your peers, your instructor, or your own reflection. Quizzes will be administered using an iClicker device.

Reflections: You will complete 5 reflections on recent course topics and to monitor your learning process. These reflections will have directed prompts to guide your reflection, but there will also be an open field for you to expand on any component of the lecture content. I will also emphasize metacognition in these reflections, or having you learning about your learning process: what works, what doesn't work, how to study/learn more effectively. Reflections will likely be around 400-500 words (more if desired). Reflections will be submitted through the course website following the schedule at the end of the syllabus.

Laboratory Assignments: Labs are the best opportunity to get see and work with plants, either in the lab itself or out in their natural habitats. Each lab will have a worksheet to be submitted for completion. Labs will also be used to build towards the Botany Map.

Term Tests: The take-home term tests will cover specific lectures and be due 72 hours after being released through the course website. The term test will consist of case study evaluations and short answer/essay questions. It will also include directed reflection questions. The term test will be submitted through the course website. The term test will be open book, but you are encouraged to take notes so you can develop knowledge recall and application in preparation for the final exam and when you apply your learning and understanding of ecology to your everyday life.

Botany Map: By the end of the term, you will draw a Botany Map. The map will consist of two themes: (1) comparing and contrasting the biology of different types of plants encountered in lecture, lab, and your personal life; and (2) making a map of the plant communities we have encountered in lab (including plants, pollinators, herbivores, and microorganisms) and their environmental context. Additional instructions will be provided on the course website, but the goal is to synthesize everything you have learned in lecture and lab and providing you an opportunity to not only see what you have learned but also see what plants you have observed, where you encountered them, and to think about our relationships with plants.

Evaluation

We will be using the 'ungrading' approach to all evaluations rather than traditional grading systems. Ungrading can be a fairly complex approach, but the main point is to make evaluation and assessment more of a conversation between you and myself. We are able to do this through a combination of feedback and reflection. Below I will expand on the evaluation for each type of coursework and how ungrading will be applied.

Lecture Quizzes: Lecture quizzes will be submitted via iClicker devices and evaluated for completion. If you attend the lecture and complete the quiz, you will receive credit.

Reflections: Lecture reflections are designed for you to articulate what you learned from the lecture and lab. I will provide comments and feedback on each reflection, offering advice, clarification, and encouragement as appropriate. I will also be using these reflections to help identify common challenges, misconceptions, or misunderstandings, so it is important that reflections also discuss challenging topics. Reflections will be evaluated for addressing the directed reflection prompts.

Laboratory Assignments: Each lab will get you working with plants, either in the teaching lab or out in the field. Assignments will consist of worksheets that are dure at the end of each lab section and will be marked for completion. I will evaluate worksheets and provide any necessary feedback, and worksheets will be returned to you within 1 week.

Term Tests: The take-home term tests will cover specific lectures and be due 72 hours after being released through the course website. The term test will consist of case study evaluations and short answer/essay questions. It will also include directed reflection questions. The term test will be submitted through the course website. The term test will be open book, but you are encouraged to take notes so you can develop knowledge recall and application in preparation for the final exam and when you apply your learning and understanding of ecology to your everyday life.

Botany Map: You will create a Botany Map that (1) compares and contrasts the biology of plants and (2) maps the plant communities and the environments in which they are situated to synthesize and demonstrate your knowledge. I will provide a core checklist of expectations for the Botany Map on the course website. Maps can be drawn, but you also have the ability to showcase your talents and interests outside of the science classroom as well. If you think you can better express your learning beyond a simple map (e.g., video, painting, choreography, podcast), please just let me know and we will find a way for your work and learning to be evaluated.

I will evaluate your Botany Map according to the core checklist and provide feedback**.** You will use this feedback and evaluate how many points you think you earned. I will then compare the points I think you earned, the points you think you earned, and the average of the two scores. If my score is higher than your score, we will typically use my point score.

Teaching Methods and Academic Supports

BIO150 is an active learning class where you are part of the learning process. You are expected to come to class ready to engage in the material by participating in lecture activities, collaborating with your peers, and applying the concepts learned to case studies and lab projects. **Learning can also bring about discomfort, and I will be challenging you in this course. I will challenge you because I know we all have the potential to grow and learn**.

Ungrading is central to this course. While ungrading does require work from both you and me, that work has lasting benefits beyond any single lecture or discussion. I want to help you learn about and have fun with building data literacy, but I am also here to help you grow as a learner. **Through the process of ungrading, we will stress less on any grade and focus more on learning.**

Lectures

Lectures will expand on aspects of the assigned readings by going into great depth and applying knowledge to case studies and examples. You are responsible for reading the assigned readings before class to get the most out of the lectures. All lectures will be recorded and posted to Quercus within 24 hours.

Labs

You will get to work directly with plants, either in the lab or out in their natural habitats. Labs will also help you build towards your Botany Map.

Time Management and Learning Practices

If you find you are struggling with time management or keeping up with the material, please come to student (office) hours or we can schedule a private, one-on-one meeting. You may also talk to your academic advisor or the Robert Gillespie Academic Skills Center for guidance and advice on time management and effective learning practices. **I know that every student can succeed in this course, but sometimes the learning environment and support systems just need to be restructured to make that happen**.

Procedures & Policies

E-Mail Policy
The University's official method of correspondence with students is through their University of Toronto e-mail accounts. It is the student's responsibility to keep his/her @mail.utoronto.ca account active and check it on a regular basis.

All e-mails from students must include your full name and student number as well as have the course code in the subject line.

Re-Mark Policy
Requests for re-evaluation of course work must be made in writing to the instructor no later than one month following the return of the work. Re-evaluation may result in a grade increase, decrease, or no change.

Further Notes on the Re-Mark Policy
By using the ungrading approach, we will actively discuss evaluations and should therefore reduce the likelihood of any remark. That being said, we will still follow the official University of Toronto remark policy discussed above.

Further Notes on the E-Mail Policy
To help me better respond to emails, please include BIO150 in the subject line and then your student number either in the text or signature of your email. I also ask for patience when responding to emails. I will try to respond as quickly as possible but give me at least 24 hours to respond to any message. I likely will not respond to emails over the weekend, but I will aim to respond to by 5 PM the following Monday.

Attendance and Participation
Attendance is essential for your learning, as is your participation in active learning during lectures and labs. I will not take attendance during lecture, but attendance will be taken during labs.

Absences
Absences from computer labs must be communicated to me by email before that class period is over. Please send the email with a brief explanation for the absence. For an absence to be excused, it must meet University-approved and beyond-your-control criteria. Absences beyond University guidelines may be excused on a case-by-case basis.

Religious Observance
You are encouraged to observe and express your religious identity. I will make reasonable accommodations to allow any student to observe their religious practices without penalty. Please look at the course schedule below and let me know if there are any potential conflicts. Accommodations do not absolve students of responsibility for the coursework, but they can result in extensions.

Information about the University's Policy on Scheduling of Classes and Examinations and Other Accommodations for Religious Observances is at http://www.viceprovoststudents.utoronto.ca/publicationsandpolicies/guidelines/religiousobservances.htm

Classroom Management
You and I are expected to come to lectures and computer labs prepared, on time, and with our cell phones and other devices on silent and only to be used for lecture or computer labs activities. All lectures will be recorded over Zoom and posted on the course website by the next day following the lecture.

I expect you to treat yourself and others with respect in our learning community so we can engage, learn, and grow throughout the course. We each bring our own identities and experiences from our everyday lives, and that diversity will be celebrated.

Late Policy and Extensions
You are expected to complete and submit all assignments on time, although extensions and accommodations can be provided.

Late Policy
Group project reports will have a penalty of 15% for each day the assignment is late up to a maximum of 3 days, after which late submissions will not be accepted. Only group project reports will be accepted with a late penalty; no other assignments be accepted after the due date except for extreme circumstances. I have this policy to encourage you to stay on top of the material, which is to your benefit and that of your peers.

Extensions
If you require an extension to complete an assignment due to injury, illness, or accessibility, please let me know as soon as possible and preferably at least 24 hours advance of the due date. Extensions beyond accessibility and illness will be granted on a case-by-case basis.

Academic Integrity

The code of Behaviour on Academic Matters states that:

The University and its members have a responsibility to ensure that a climate that might encourage, or conditions that might enable, cheating, misrepresentation or unfairness not be tolerated. To this end all must acknowledge that seeking credit or other advantages by fraud or misrepresentation, or seeking to disadvantage others by disruptive behaviour is unacceptable, as is any dishonesty or unfairness in dealing with the work or record of a student.

- University of Toronto Mississauga Academic Calendar

It is your responsibility as a student at the University of Toronto, to familiarize yourself with, and adhere to, both the Code of Student Conduct and the Code of Behaviour on Academic Matters.

Notes on Academic Integrity

We will not be using Ouriginal for plagiarism detection in this course; however, generative AI (e.g., ChatGPT) will not be permitted in any form during this class and its use will be considered a violation of academic integrity. I am looking to see how you grow and learn throughout the course by looking at your work, not that of an algorithm or text-mining program.

Additional Notes

Personal Health Resources

There are many resources available through UTM that can benefit students and I would encourage you to use these resources discussed below to help you make the most of your time at UTM. These include:

The Equity, Diversity, and Inclusion Office: https://www.utm.utoronto.ca/equity-diversity/

The Indigenous Centre: https://www.utm.utoronto.ca/indigenous-centre/welcome-indigenous-centre The Health and Counselling Centre: https://www.utm.utoronto.ca/health/health-counselling-centre
This also includes the My Student Support Program or MySSP which provides University of Toronto students with immediate and/or ongoing confidential, 24-hour support for any school, health, or general life concern at no cost to students. You can call or chat with a counsellor directly from your phone whenever, wherever you are for a range of concerns. Students who use MySSP still have access to existing campus and community mental health services; MySSP is an additional support service. You can also access the service 24/7 by calling 1-844-451-9700. Outside of North America, call 001-416-380-6578. There is also an App you can use to access this service (https://myssp.app/ca/home).

Another number to have saved is Good2Talk (https://good2talk.ca/), which is a free, confidential support service for post-secondary students in Ontario. To talk, call 1-866-925-5454. To text, text GOOD2TALKON to 686868.

Other Resources AccessAbility
The University accommodates students with disabilities who have registered with the AccessAbility Resource Centre. Please let me know in advance, preferable in the first week of class, if you will require any accommodation on these grounds. To schedule a registration appointment with a disability advisor, please call the centre at 905-569-4699 or e-mail at: access.utm@utoronto.ca.
http://www.utm.utoronto.ca/access/

Robert Gillespie Academic Skills Centre
Students can visit the Academic Skills Centre to consult with one of its strategists about understanding learning style, developing study plans for upcoming tests/exams, or discussing papers. Special Diagnostic Assessments are also offered and are designed to help you learn exactly where you stand with respect to critical academic skills.
http://www.utm.utoronto.ca/asc

UTM Library (Hazel McCallion Academic Learning Centre)
The University of Toronto boasts the biggest academic library in Canada and the second biggest in North America. Various services are available to students at the UTM Library and across the UofT library system. Services including borrowing, interlibrary loans, online references, laptop loans and the RBC Learning Commons. For more information, visit http://library.utm.utoronto.ca.

Course Schedule

Readings will be uploaded to Quercus or from The Natural Communities of Georgia (NatComGA). Lectures are organized into foundations of plant ecology (Foundations), plants of different across Georgia (Ecoregions), and applications of plant ecology (Applications).

Week	Tuesday Lecture	Assigned Readings	Thursday Lecture	Assigned Readings
1	Foundations: Molecules of Plant Life	Chapter 1	Foundations: Touring the Plant Cell	Chapter 2
2	Foundations: Movement between Cells	Chapter 3	Foundations: Respiration	Chapter 4
3	Foundations: Photosynthesis	Chapter 5	Foundations: Evolutionary History of Plants	Chapter 6
4	Foundations: Roots	Chapter 7	Ecoregion: Piedmont	NatComGA 5
5	Foundations: Shoots	Chapter 8	Ecoregion: Piedmont	NatComGA 5
6	Foundations: Plant-Bacteria Interactions	Chapter 9	Ecoregion: Piedmont	NatComGA 5
7	Foundations: Plant-Fungi Interactions	Chapter 10	Ecoregion: Blue Ridge	NatComGA 3
8	Foundations: Secondary Growth	Chapter 11	Ecoregion: Blue Ridge	NatComGA 3
9	Foundations: Growth Regulation	Chapter 12	Ecoregion: Blue Ridge	NatComGA 3
10	Foundations: Plant Nutrition	Chapter 13	Ecoregion: Ridge and Valley	NatComGA 4
11	Foundations: Flower Structure	Chapter 14	Ecoregion: Ridge and Valley	NatComGA 4
12	Foundations: Plant-Pollinator Interactions	Chapter 15	Ecoregion: Coastal Plain	NatComGA 6
13	Foundations: Sexual Reproduction	Chapter 16	Ecoregion: Coastal Plain	NatComGA 6
14	Foundations: Plant Defenses	Chapter 17	Applications: Urban Environments	Chapter 18
15	No Class (Thanksgiving Break)			
16	Foundations: Plant-Herbivore Interactions	Chapter 19	Applications: Urban Environments	Chapter 18
17	No Class (Final Exams)			

Lab Schedule

Week	Topic
1	Plant cells under a microscope
2	Measuring respiration
3	Photosynthesis and environmental stress
4	Survey of campus plant diversity
5	Compare and contrast root and shoot structure of plants
6	Building a Botany Map: first steps and discussion
7	'Field trip' to the Blue Ridge in the greenhouse
8	Investigating plant-bacteria-fungal mutualisms: experiment
9	Plant pathogens in the Blue Ridge: American Chestnut, Eastern Hemlock, and *Rhododendron*
10	'Field trip' to the Ridge and Valley in the greenhouse
11	Comparison of flower structure, seed morphology, and reproduction
12	'Field trip' to the Coastal Plain in the greenhouse
13	Investigating plant-bacteria-fungal mutualisms: harvest, data collection, and analysis
14	Quantifying and comparing herbivory across habitats on campus: field collection
15	NA (Thanksgiving Break)
16	Quantifying and comparing herbivory across habitats on campus: data collection and analysis
17	NA (Final Exams)