

QUEEN'S UNIVERSITY
Ontario Universities Program in Field Biology

Course Title:	Plant Biodiversity & Evolution
Instructor(s):	Sarah B. Yakimowski (sarah.yakimowski@queensu.ca; 613-533-5257)
Dates:	Sunday, June 2nd to Sunday, June 16 th
Location:	Queen's University Biological Station (QUBS), 280 Queens University Road, Elgin, ON 613-359-5629
Cost:	<p>\$1,300 for accommodations, meals, and lab/field expenses (\$350 non-refundable deposit to your home university + \$950 due Friday May 3, 2024)</p> <p>Includes field trips, canoeing, wi-fi, full room + board Excludes: Students will bring appropriate field clothing and arrange transportation to/from QUBS (transportation from Kingston to QUBS may be available upon request)</p>
Prerequisites:	Undergraduate course in general biology. Additional course(s) in ecology, evolution and statistics are recommended but not required.
Enrolment:	12 (3 reserved for Queen's Students)
Course Description (brief):	<p>Plants exhibit remarkable diversity in reproductive, life history and stress tolerance strategies. <i>How do plants, with their sessile habit, survive and reproduce each season in the face of unpredictable environmental conditions? What ecological and genetic factors generate and maintain diverse reproductive strategies? How do interactions between plants and the environment influence the evolution of plant traits?</i> We will consider implications of these questions in the contexts of climate change, biological invasions, and conservation.</p> <p>QUBS and the Rideau Lakes area of eastern Ontario, offer an abundance of habitats and diverse flora. We will take particular advantage of the late-spring conditions, as plant populations establish and prepare for summer. The first week of the course will involve hands-on field exercises, herbarium collections and a group project. During the second week students will develop and execute an independent project based on their own developing interests in plant ecology and evolution.</p> <p>Daily activities involve hands-on experience with plant identification, specimen preparation, biodiversity surveys, floral morphometrics, and population demographics. We will also focus on strategies for experimental design, statistical analysis (in R), and presentation of results in both group and solo projects.</p>
Evaluation:	<p>Natural history 'ice breaker' (5 min presentation): 10% Field notebook evaluation: 10% Herbarium collection assignment: 15% Group biodiversity projects: 10% Participation: 15% Individual project presentations: 10% Individual final reports (10-15 pages; due 4 weeks after end of course): 30%</p>

An Average Day – What to Expect

(a) Daily timeline	An average workday begins with a catered breakfast (7:00-8:00) followed by half- to full-day guided learning activities in field, lab or indoor learning settings. Each day includes a catered lunch (12:00-13:00) in the field, and dinner (18:00-19:00) served in the main lodge. Evening sessions (19:30-21:30) may include presentations, lab work and statistical tutorials.
(b) Work habitat & Physical exertion	Light hiking around QUBS property can include terrain around marshes, lakes and rivers, with potential for slippery rocks and muddy conditions in a variety of cool to hot weather conditions. Tick and mosquito-borne diseases (e.g. Lyme, West Nile) are potential hazards that can be mitigated with proper clothing and repellents. Outdoor activities may occur in a variety of weather conditions including cold rain or summer heat. Everything required for a day in the field (e.g. clothing, snacks, water, toiletries) must be packed and carried. Meals are provided but dry, odourless snacks are also recommended to maintain energy between meals. Bathrooms are available in the morning and evening but during the day students may need to make use of the surrounding vegetation. Students must be prepared to spend full days in the field.
(c) Common activities	<ul style="list-style-type: none"> • Canoe travel across open water – risk of sea sickness, drowning, finger/hand injuries from sampling equipment and docking procedures. Life jackets will be provided and must be worn. • Hiking around QUBS hiking trails – risk of tick or mosquito bites and potential for disease (e.g. Lyme, West Nile); risk of injury from thorns, sprained ankle, old wire fences, poison ivy exposure, blisters from poor footwear, heat exhaustion, hypothermia. Students should bring proper clothing (e.g. light material, long sleeve, full pants, not shorts), proper footwear and strong repellents that are effective against arachnids. Tick gaiters or long socks to tuck in pants are highly recommended to mitigate risks of tick bites and Lyme disease. • Lab work – risk of exposure to toxic chemicals. Disposable gloves and other safety equipment will be provided.
(d) Weather, dehydration, & biting insects	<ul style="list-style-type: none"> • Temperatures can vary considerably from excessively hot (>30°C) to cold and wet (< 10°C). Students should bring appropriate field clothing and dress in ‘layers’ that can be adjusted to ambient temperatures. Bring containers for up to 2L of water, and a variety of field clothing appropriate for variable weather conditions. • Regardless of temperature, strong sun and high UV are likely. Students should bring a large sun hat and high SPF sun blocking cream to mitigate these effects.
(e) Toxic/poisonous, wildlife/ plants	<ul style="list-style-type: none"> • Ticks and mosquitoes in this area can carry a variety of pathogens including West Nile virus and the bacteria that cause Lyme disease. These risks can be mitigated by wearing a wide-brimmed hat, pants (not shorts) and long-sleeved shirt, sprayed with a strong acaricide or insecticide that is also effective against ticks and mites. • Hiking trails may have poison ivy, which can be mitigated by avoiding direct contact with skin (e.g. wearing long pants, long sleeves and washing clothes after field use). • Black bears are also a potential risk during day hikes. To mitigate this risk, bring a loud whistle or other noise maker and avoid bringing any food with a strong smell into the field. • Other injuries (e.g. sprained ankle, broken limb) are possible so students should take care when hiking. There are few time constraints so students should hike at a pace they are comfortable with and students should stay together with their groups in case somebody is injured.
(f) Sleeping, washroom & laundry facilities	<ul style="list-style-type: none"> • Sleeping accommodations at QUBS include a bed with mattress. It is recommended that students bring their own cover sheet, sleeping bag and pillow to ensure a good night’s rest. Shared rooms may be located within a single co-ed lodging building, depending on space availability. • Field clothes should be washed or stored in plastic bags to prevent introduction of ticks into the sleeping quarters. Paid laundry is available on-site. Showers, sinks and flush toilets are available but may require a short walk to the main lodge (<100m). Students are responsible to keep the rooms clean to avoid attracting vermin.
(g) Meal plans & food allergies	Full meals are provided. Options for dietary restrictions (e.g. vegan, vegetarian, allergies) can be accommodated, but must be communicated to the course coordinator prior to arrival.
(h) Non-academic responsibilities	Students may be asked to help with dishes and sweeping/cleanup after communal meals
(i) Degree of isolation	QUBS is large and isolated, occupying >3,400 hectare. The main lodge is fully serviced with electricity, plumbing and wi-fi/internet but no cell phone signal is available for much of the property. Students should always stick together with their assigned groups, and stay within site of the designated hiking paths at all times. The closest hospitals are more than an hours’ drive, so any serious injuries can quickly become life-threatening.
(j) Alcohol & drugs	QUBS is part of Queen’s University and activities are therefore subject to all rules and regulations relevant to Queen’s campus. Smoking of any kind is prohibited on campus. Alcohol is not strictly prohibited but is restricted to personal accommodation spaces. Due to the increased isolation and dangers associated with work at QUBS, students must be sober for all activities and always behave responsibly; failure to do so will result in immediate expulsion from the course.
(k) Vaccinations/ Insurances	No additional vaccinations or insurance are needed for Ontario residents with OHIP coverage. Students are reminded to bring their Health Cards in the unlikely event that hospital treatment is needed.

Module #8

(l) Social Situations	<p>This is a two-week, intensive field course. During this time students will be engaged in full-day activities, living in close quarters with other students in the course and likely additional students from other courses or students working at QUBS for the summer. A few social activities are planned in order to bond and generate lasting friendships.</p> <p>In order to do this, it is important that we all follow Queen's Code of Conduct, which is based on the premise of mutual respect. There is a zero-tolerance policy for harassment or violence towards any student or staff at QUBS. Any violations of this policy should be immediately reported to the course instructor or QUBS staff.</p>
(m) Final comments	<p>This is an intensive field course that teaches fundamental skills in field studies, plant biodiversity and herbarium collections relevant to biodiversity research in ecology and environmental science. Past students have given this immersive course high ratings. This field course is designed to provide students the opportunity to observe biological concepts first-hand, and to gain hands-on experience with biological methods.</p>