Queen's University Module #2

Course Title:	**Plant Reproductive Evolution & Conservation**
Instructor(s):	Dr. Christopher Eckert, Queen's University (chris.eckert@queensu.ca) Regan Cross, Queen's University (17rc28@queensu.ca)
Dates:	1–14 May 2022
Location:	Elbow Lake Environmental Education Centre, eastern Ontario, Canada
Cost:	• $1400 ($350 deposit + $1050 paid later, see below) which covers all costs except transportation to Kingston Ontario. • To confirm your enrolment, we must receive the $1050 balance (cash or cheque made out to Queen's University) by 25 March 2022. This is a firm date. Failure to pay the balance on time will result in your losing your spot to someone from the waiting list. • To cancel and get your balance back, you must inform us in writing by 1 April 2022. This gives sufficient time to find a replacement for you. If we cannot find a replacement, your deposit is forfeit. • If you cancel after 1 April 2020, we reserve the option of keeping your deposit + balance, but will do so only if we have no alternative. We will try to find a replacement, and if we do, you'll get your money back. You are welcome to find a replacement for yourself, and then we're all happy.
Prerequisites:	Completed 2nd year in a biology program. Introductory ecology, evolution and statistics is helpful but not essential. Up to date tetanus shot. Full COVID-19 vaccination recognized by the Canadian government. Sense of humour and a love of the outdoors.
Enrolment*:	18
Description:	• When it comes to reproduction, plants are incredibly cool, amazingly diverse and provide unlimited scope for asking unresolved questions about how evolution works. This course explores the major trends in plant reproductive evolution using the diverse flora and habitats of the Frontenac Arch in eastern Ontario. • We'll focus mostly on the evolution of plant reproductive strategies; particularly the evolution of plant sexual systems and dispersal strategies. We'll also consider the implications of plant evolutionary ecology for conservation and management. • As a group, we will pose hypotheses, design observational and experimental studies, collect data and perform appropriate analyses data to test our hypotheses. • All students will also participate in group research projects that provide hands-on experience with the local flora as well as the fundamentals of experimental design, data analysis and scientific writing. • The course will involve a lot of time in the field exploring plant diversity while hiking along the extensive and wonderful trails at Elbow Lake and the Queen's University Biological Station. Students will learn how to identify plants and make careful observations to uncover their many secrets.
Evaluation:	(1) Trailside seminar in the field (20% of your total mark) (2) Formal write-up of a group field research project (40%) (3) Field notebook (10%) (4) Practical hands-on exam conducted in the field (10%) (5) Presentation of group research proposal (10%) (5) Participation (10%)

What to Expect

(a) Daily timeline	To maximize time in the field, we will be fed and ready to roll at 8am each morning. Depending on the day's activities we wilk take lunch with us. We will typically return to the Elbow Lake Centre at 5pm for dinner. On some evenings, especially during the first week of the course we will process samples, analyze data and review the day's natural history observations. After about 9pm students usually socialize until they choose to retire for the evening. The instructors will lead night hikes regularly to observe nocturnal creatures but these are optional.
(b) Work habitat & physical exertion	We will go on extended hikes almost every day of the course. Students can expect to hike 10 km per day through wooded but sometime rugged terrain. Everyone carries a backpack with field equipment, changes of clothing, rain gear and at least 2 L of water. Sturdy footwear and decent physical fitness are essential.
(c) Common activities	The activities that we engage in each day will depend on the hypotheses we are trying to test, either as a group of in research project teams. Every day will involve careful observations, making detailed field notes, identifying plants, making measurements, using GPS devices and other scientific equipment.
(d) Weather, dehydration & biting insects	The weather in early May can be glorious and warm but also quite cold with bouts of rain. Dressing for the weather, shielding skin from the sun and staying well hydrated are extremely important. Although we will observe many wasps, bees, spiders and ants, the only insects who make a living by biting humans at that time of year are ticks, blackflies and mosquitoes. Insect repellent and bug hats will come in handy.
(e) Toxic/poisonous, wildlife/plants	Eastern Ontario has few biotic hazards in terms of toxic wildlife or plants (some poison ivy). But ticks are abundant at this time of year and, in eastern Ontario, often carry the bacteria that causes Lyme's disease. Students will be shown how to avoid being bitten by ticks.
(f) Sleeping, washroom & laundry facilities	We will sleep in quite comfortable cabins and eat in a heated central pavilion with kitchen and washroom facilities. Students must bring their own bedding appropriate for cool nights. There will be some opportunity to do laundry.
(g) Meal plans & food allergies	Breakfasts will be simple cereal, toast and coffee/tea and students will make their own bagged lunches from ingredient provided. Hot dinner will be served back at Elbow Lake by an excellent local caterer. We can accommodate all food allergies and dietary restrictions.
(h) Non-academic responsibilities	Students will cooperate in organizing, sharing and generally taking care of all research equipment. All students must abide by the Queen's University Student Code of Conduct (https://www.queensu.ca/secretariat/sites/uslcwww/files/uploaded_files/policies/board/StudentCodeOfConduct.pdf).
(i) Degree of isolation	Cell service is spotty at Elbow Lake but we are within 911 coverage in the case of emergencies. Professional medical services are available in communities in Kingston, a 30-minute drive from Elbow Lake.
(j) Alcohol & drugs	Students must behave responsibly and abide by the Ontario liquor and drug laws. The legal age to consume alcohol or Cannabis is 19, and these may consumed only in designated areas at Elbow Lake. Students are expected to not be under the influence of any non-prescription substances during course work hours. Work missed due to hangovers cannot be made up.
(k) Vaccinations & insurances	All students will require the full suite of COVID-19 vaccinations. Students must bring their health care cards and/or proof of insurance with them.
(l) Social situations	Students will spend 2 weeks together in close quarters and working on group field exercises and research projects. There will be plenty of opportunity for socializing. Mutual respect and tolerance are essential components of participation in this course. Harassment of, or violence towards, other students or users of the facilities and areas we visit will not be tolerated. Any incidents should be immediately reported to either of your instructors. Appropriate actions will be determined by your instructors in consultation with Queen's University Emergency Report Centre to ensure the safety and security of all course participants.
(m) Final comments	The goal of this course is full immersion in plant diversity in the wonderful habitats of eastern Ontario. By spending as much time in the field as possible you can experience the many fascinating facets of biological diversity. In the past students have really enjoyed the course and particularly appreciated the opportunity to develop, execute and write-up their own group research projects.