

## CARLETON UNIVERSITY

### Ontario Universities Program in Field Biology

<b>Course Title:</b>	<b>Behavioural Ecology of Bats</b>
<b>Instructor(s):</b>	Dr. Christina Davy, Carleton University, <a href="mailto:Christina.Davy@carleton.ca">Christina.Davy@carleton.ca</a> , (647) 838-8946
<b>Dates:</b>	Friday June 7 – Thursday June 20, 2023 (Arrive June 7, depart June 20; field work June 8 - 19)
<b>Location:</b>	Carleton University, Ottawa, Ontario (with field work conducted at sites in and around the City of Ottawa)
<b>Cost:</b>	<p>Course Fees = <b>\$2700</b>, payable as a <b>\$350</b> non-refundable deposit to your home university, and <b>\$2350</b> balance to Carleton University <b>due by April 1st</b>. Students with confirmed reservations will receive emailed instructions on how to pay the course balance well in advance of the payment deadline.</p> <ul style="list-style-type: none"> <li>Fees includes accommodations in residence on the Carleton campus and meals from dinner on June 7 – breakfast on June 20; access to field equipment used on the course; and transportation to and from the various field sites.</li> </ul> <p>Students are responsible for their <b>own transportation</b> to the group accommodations in Ottawa. Students are expected to participate fully in the course (i.e., for students who live in Ottawa, prepare to be “away from home” from June 7 - 20 so that you can participate in all aspects of the course).</p> <p><b>Students are responsible for obtaining vaccination against rabies at their own cost</b> before the course start date (guidance on obtaining vaccination will be provided). Cost of rabies vaccination is typically ~\$450.00, but this vaccination is required for a number of jobs working with wildlife and may therefore prove valuable depending on your career goals.</p> <p><b>Students must bring a headlight with them</b>, but extra batteries (AA and AAA) will be provided. Recommendations for good, affordable options will be provided after registration.</p>
<b>Prerequisites:</b>	Completion of second year in a Biology, Env. Sci., or similar program (by May 2024); and at least one ecology (or equivalent) course beyond the Introductory level. If you do not meet these academic prerequisites, please contact Dr. Davy to discuss first.
<b>Enrolment:</b>	12 (6), minimum 6
<b>Course Description (brief):</b>	Bats – the only flying mammals – are an incredibly diverse group with over 1,400 species described to date. In this course we will explore the behaviour, ecology, and conservation needs of bats, focusing our field work on the eight species found in Ontario. In doing so, we will learn and practice a number of field techniques, including acoustic surveys, transect sampling, capture-mark-recapture, and the collection and curation of biological samples. By working in highly urban field sites in the City of Ottawa and non-urban sites in the Ottawa Valley, we will also explore questions about urban ecology. Alongside outdoor field work, we will review foundational and recent studies in bat ecology through a series of mini-lectures and student-led presentations from guest scientists working with government, industry, academia and NGOs. Development of research questions and study design will be practiced throughout the course, including production of a study proposal due at the end of the first week. We will celebrate the end of our time together by sharing outreach videos you will have created during the course. A final report is due 4 weeks after the end of the course.
<b>Evaluation:</b>	<p>Paper presentation (to be prepared in advance; instructions will be provided) 15%</p> <p>Animal Care Approval and Certification 5%</p> <p>Quiz 10%</p> <p>Outreach videos (prepared in groups) 10%</p> <p>Study outline 20%</p> <p>Final written report 40%</p>

## An Average Day – What to Expect

<p>(a) Daily timeline</p>	<p>Most days will start with a class meeting for a late breakfast around 11:00, followed by mini-lectures or student presentations, and planning for the afternoon and night’s field work. Afternoon field work can include scouting new capture locations, setting or retrieving acoustic recording units, or radio-tracking bats tagged on previous nights. In the evening we will set mist nets or harp traps at field sites, which may include sites in Ottawa itself or up to 2 hours drive away from the city. Most dinners will be eaten in the field after setting nets, and before bats emerge at dusk. Students are responsible for assisting with net and trap set up, careful handling of the bats (following training and approved animal care protocols), data collection, and trap takedown and cleaning. Work with bats requires us to wear KN95 masks (so that we don’t transmit Covid19 to the bats), so students must be willing to wear a mask during some work, including on hot or humid nights.</p> <p>On some days we will host guest scientists who work in government, in academia, as consultants, or with NGOs, providing opportunities to discuss career paths as well as bat ecology. Students should expect long days and substantial time outdoors, exploration of a variety of sites and habitats in and around Ottawa, and lots of team work. Team work is exciting when things are going well, but can be difficult at times either when circumstances are challenging, or if personality conflicts arise. Occasional conflicts or disagreements are a normal part of working with other people, and resolving these is a field biology skill too, akin to collecting samples or planning research studies! Students are expected to work respectfully with one another (and the course instructor, if necessary) to resolve any conflicts that arise, and to maintain a team environment that is safe, productive, inclusive – and hopefully also fun.</p> <p>This field course involves work late into the night, including late-night equipment take-down and cleaning, and long drives back to accommodations. Although days will start later than usual, students can expect to be up until 2-4 am on some nights as the timing of each night will vary depending on the field site and on how many bats we catch. We will ensure time for at least 8 hours of sleeping time a night, but this is not a suitable course for students who struggle when their schedule becomes irregular. Finally, students are expected to disconnect from their devices while participating in the course (e.g., scrolling through social media is acceptable during free time periods, but not during course time).</p>
<p>(b) Work habitat &amp; Physical exertion</p>	<p>No particular field experience is required for this course, and we welcome students who want to gain field experience, but are unsure where to begin. However, students must be willing to spend long periods outdoors in sometimes uncomfortable conditions (heat, cold, rain, biting mosquitoes, etc.), and to help with tedious or challenging tasks such as cleaning equipment and setting nets.</p> <p>Summer days can be quite hot and some summer nights can get quite cold, so students should pack accordingly (a packing list will be sent out with the full course information). We will hike long distances at some sites over rough terrain, often carrying heavy equipment, so sturdy footwear (hiking boots or similar) is required.</p> <p>Some students find it difficult to work at night or to function well on an irregular sleep schedule. Please be aware that this field course involves both.</p>
<p>(c) Common activities</p>	<ul style="list-style-type: none"> <li>• Common activities include work outside at night, both in urban areas and in more remote locations.</li> <li>• Associated risks: Locations outside Ottawa are in bear country, although we will be working in groups with bear-safe methods. Locations within Ottawa include urban parks that are also used by people. In both cases, we will work in groups to ensure we are safe throughout. Insect bites (mosquitoes, etc.) are likely, and ticks are present and can sometimes carry Lyme disease. Hiking requires sturdy footwear that will not cause blisters.</li> </ul>
<p>(d) Weather, dehydration, &amp; biting insects</p>	<ul style="list-style-type: none"> <li>• Ontario summers can be very hot and humid, but summer nights can get quite cold. Students should be prepared to dress for hot days (sunscreen, light shirts; a large water bottle to carry in the field) and cool nights (layers, a warm sweater and warm hat). Bug jackets may be useful on some nights as mosquitoes are sometimes intense.</li> </ul>
<p>(e) Toxic/poisonous, wildlife/ plants</p>	<p>Ticks and Lyme disease are present in the study area. Regular tick checks will be encouraged, and guidance to seek medical attention if an embedded tick is found. Poison ivy is also common in the study area. We will review how to recognize poison ivy, and how to minimize the chance of reaction if contact is made.</p>
<p>(f) Sleeping, washroom &amp; laundry facilities</p>	<p>Students will sleep in rooms in residence rooms, with one student per bedroom and 2-4 students per suite. We will have access to standard washroom facilities, and coin laundry facilities if needed.</p>
<p>(g) Meal plans &amp; food allergies</p>	<p>Meals will be provided (some in the campus cafeteria, and others as packed lunches and dinners in the field). Reasonable accommodations will be made for food restrictions or allergies. Please contact the instructor as soon as possible following registration if you require any particular food accommodations, so that these can be arranged.</p>
<p>(h) Non-academic responsibilities</p>	<p>Students are expected to assist with preparation of equipment each day, and with the cleaning and storage of equipment after each night. Students are expected to keep the accommodations, course vehicles, and other spaces used during the course tidy. Students are also expected to contribute to a safe and respectful working environment, and this includes taking care of themselves, letting the instructor know if they are unwell or require assistance, and acting respectfully towards one another.</p>

## MODULE#11

(i) Degree of isolation	This is not a remote or isolated course, and we will have regular access to wi-fi as we are spending most of our time in an urban setting. However, students are expected to disconnect from their devices during coursework, to fully participate in the course. Some of the non-urban sites we will visit do not have reliable cell service, but service can be reached nearby in case of an emergency, and we will end each night in cell service range.
(j) Alcohol & drugs	There is a no-alcohol, no-marijuana policy during the course, because we will be working with small, fragile animals and need to ensure that all participants are in a clear state of mind during this work.
(k) Vaccinations/ Insurances	Students must be vaccinated against rabies and provide proof of a valid rabies titre to the course instructor before the start of the course. Instructions on obtaining a rabies vaccination will be provided following registration. An up-to-date Covid19 vaccination is strongly encouraged.
(l) Social Situations	Students must be considerate of those with whom they share sleeping quarters, and must work collaboratively with one another on course activities.
(m) Final comments	Although we will work hard and this course is demanding (see above), it is also a chance to engage with an incredible group of animals that you might otherwise not get the chance to study. It is an opportunity to meet like-minded people, learn more about behavioural ecology and urban ecology, and think more deeply about the kind of career you wish to pursue after graduating (and how you can get there). The descriptions above are intended to clearly outline what you can expect - but you can also expect this course to be enjoyable, and to be introduced to new ideas.