

**CARLETON UNIVERSITY**  
**Ontario Universities Program in Field Biology**

<b>Course Title:</b>	<b>Fish Ecology and Fisheries: The Science Behind Conservation and Management</b>	
<b>Instructor(s):</b>	Dr. Chris Elvidge (Carleton University & University of Eastern Finland); <a href="mailto:chris.k.elvidge@gmail.com">chris.k.elvidge@gmail.com</a>	
<b>Dates:</b>	April 28 – May 11, 2019	
<b>Location:</b>	Queen's University Biology Station (north of Kingston, ON: <a href="https://qubs.ca">https://qubs.ca</a> )	
<b>Cost:</b>	<p>\$1250 (<b>\$350 non-refundable deposit</b> to your home university; <b>\$900 balance</b> to Carleton University).  The balance is due by <b>March 22, 2019</b> payable by cheque to:</p> <p style="text-align: center;"><b>Carleton University 814308-189024</b></p> <p style="text-align: center;">The cheques should be mailed to: Ruth Hill-Lapensee, Dept. Biology, Carleton University, 1125 Colonel By Dr, Ottawa, ON K1S 5B6.</p> <p><b>Includes:</b> all accommodations, meals, wi-fi, use of boats and equipment, transportation during the course.  <b>Excluded:</b> Students are responsible for travel costs to and from QUBS.</p>	
<b>Prerequisites:</b>	<p>Second- or third-year course work in ecology, conservation biology, environmental science, geography, or behavioural science/psychology.</p> <p><b>NOTE: Students must be comfortable around water and boats, and able to work outdoors under variable conditions. All participants MUST, at some point, handle live fish.</b></p>	
<b>Enrolment*:</b>	12 (3 reserved for Carleton University)	
<b>Course Description (brief):</b>	<p>Eastern Ontario is home to a diversity of freshwater ecosystems and fish species, providing an ideal backdrop for a field course examining the ecology, conservation and management of fish and fisheries. The objective of the course is to introduce students to the conceptual foundations of fisheries science and aquatic ecology research while providing them with some of the practical skills needed for research, data analysis, and fisheries assessment. Through lectures and hands-on activities students will be exposed to diverse practices in contemporary fisheries research, conservation, and management. Students will work in groups with the guidance of the instructors to execute their own research projects with the aim of generating data to publish in peer reviewed journals. This will give participants the opportunity to experience the scientific publication process (after the course concludes). At the conclusion of the course students will be able to collect fish using a variety of gear types (e.g. electrofishing, seine nets, hoop nets, rod and reel), safely handle, and enumerate (e.g. identify, measure, tag) a variety of fish species. Students will also be able to characterize fish habitat (e.g. snorkelling surveys) to gain insight on fish-environment interactions. In addition, students will be exposed to a variety of research tools used to study the behaviour, ecology and physiology of wild fish including surgical techniques, biotelemetry, archival loggers, respirometers, field physiology sampling kits, and underwater video.</p>	
<b>Evaluation:</b>	<p>Oral presentation (20 min + 10 min discussion)</p> <p>Field notebook</p> <p>Participation</p> <p>Quiz</p> <p>Research paper (due on June 7, 2019)</p>	<p>15%</p> <p>5%</p> <p>5%</p> <p>30%</p> <p>45%</p>

Deadline to apply is **Feb 8, 2019**.

If interested please complete the application form and submit it to the OUPFB course coordinator at your school.  
Deposit of \$350 is due at the time of registration.

Tuition at your home institution is *in addition* to any field module costs.

Students who drop a field course should not expect a refund of any field course costs.

Students are encouraged to purchase cancellation insurance if airline tickets are required.

Students are responsible for all fees incurred by the home or host university due to any bounced cheque.

## An Average Day – What to Expect

(a) Daily timeline	In general, we will be working around the meal schedule at QUBS. QUBS serves meals three times per day (breakfast at 7:30-8:30, lunch at 12:00-13:00, dinner at 17:30-18:30). A typical day will involve starting in the field or the classroom at 8:30, breaking for lunch, working until dinner, and then reconvening for group or classroom activities from 19:00-21:00. Whenever we are not on the lake on a boat, students are free to use the washroom whenever necessary. These details may change as opportunities presents themselves, e.g. fishing at 05:00 or night-sampling at 00:00. Replacement sleep time will be allocated as needed.
(b) Work habitat & Physical exertion	We will be working in and around water, and on boats of varying sizes, as well as in a wetlab. Being comfortable around water is a must. Life jackets will be present at all times, and waders will be available for shallow-water sampling. Working with animals involves keeping them healthy and in good condition – in the case of fish, this means carrying lots of buckets and coolers full of fresh water. Electrofishing will involve wading in hip-deep water with a heavy backpack for a short period of time.
(c) Common activities	We will be capturing and handling fish, which can involve minor stabbings from hooks, fish spines, and small blades. Boat work always comes with the risks of slipping, docks give splinters, working in water leads to dry skin, etc., so being cognizant of these minor hazards and working to avoid them as much as possible are imperative. In addition, seasickness may be an issue for some students (Opinicon is a small lake, but it is still possible). All students MUST handle live fish at some time. No one will be required to swim. Activity-specific risks will be covered when relevant.
(d) Weather, dehydration, & biting insects	At this time of year (early May), temperatures can range from lows of 0 to highs of 30, and precipitation can range from light snow and frost to torrential rain. In short, weather can be quite variable so bring a wide range of clothing suitable for working outdoors: everything from rain gear to summer clothes/bathing suits with fall/winter gear as well. Quick-dry clothing (e.g. running or trekking gear) is great for aquatic work - spending a day in wet jeans is no fun at all. If you don't already have suitable clothing or want to update your wardrobe between now and April 28, I would point out that a rain jacket from Walmart or a \$500 Arc'teryx will both get burn holes from campfires and tear if you brush against a rusty nail, so don't break the bank. In 2017, the course occurred during the Great Flood, which significantly curtailed our activities. I hope it's hot and sunny, but we won't know until we get there. Biting insects generally are not bad at this time of year, but if you are sensitive to bites, bring some insect repellent. Sunscreen is also highly recommended for when we are working outdoors.
(e) Toxic/poisonous, wildlife/ plants	This area of Ontario has very high abundance of ticks, and Lyme disease infections are reported every year. Students need to visually inspect themselves daily. Most of our activities will be in or on the water, but vigilance is still needed.
(f) Sleeping, washroom & laundry facilities	Accommodations will be shared (2 or more people per room). If this is an issue, let me know ASAP to see if alternate arrangements can be made. Room-mates will be matched by gender (likely in the White House if you look at the QUBS website). There are beds with mattresses but you should bring your own pillow(s) and bedding. I tend to bring a set of sheets, pillow and a sleeping bag for myself. Water is hot and potable, and if it is not potable, large blue jugs of drinking water will be available. You will need to bring your own soap and toiletries and you should bring two or more towels (one for showering, one for drying off after lake work). There are kitchen facilities in the White House, including a fridge & freezer for personal items. Many of the larger cabins also have kitchen facilities. Fridge space may be shared with boxes of worms for fish catching purposes. There are coin-operated laundry facilities, and the kitchen staff can make change during their operating hours. The kitchen staff are also responsible for the sale of QUBS-branded merchandise (hats, shirts, mugs). All washrooms are equipped with running water and flushing toilets.
(g) Meal plans & food allergies	QUBS serves three meals per day (7:30-8:30, 12:00-13:00, 17:30-18:30). Outside of meal times, snacks (fruit, bread, jams, peanut butter, cereal and milk) and beverages (tea, coffee, milk, hot chocolate) are available 24 hrs. The kitchen can accommodate most food allergies (dairy, gluten, seafood, nut-free) and requirements (vegan/vegetarian). Note that there is peanut butter present, as are epi-pens, for students with nut allergies. Religious diets (Halal, Kosher) usually default to the vegetarian option when pork is served; strict religious diets (particular foods not cooked in the same facilities) cannot be accommodated.
(h) Non-academic responsibilities	Students are required to keep their living spaces (bedrooms and shared areas like kitchens and living rooms) clean, and to leave these areas clean at the end of the course. Other QUBS users will be present and on their own schedules, so mutually respecting spaces is important. There is no maid service.
(i) Degree of isolation	QUBS has full electricity, potable water, WiFi, and cell coverage (although you might have to stand outside to get good reception). It is less than an hour from Kingston and about 90 minutes from Ottawa. Smith's Falls is about 30 minutes away, so we are not dealing with remote conditions. In fact, the area is very much in the Rideau Lakes cottage country. We are well-connected, professional medical attention is not too far away, we are covered by 911 service, and several people on-site will have both basic and wilderness first aid training, but using common sense and not being reckless are always assets.  There is a convenience store/LCBO outlet a few kilometers away in Chaffey's Lock, with more grocery options ~15km from the station, if needed.
(j) Alcohol & drugs	QUBS is a university campus, so their policies on alcohol and drugs must be followed. In the past, QUBS has not been "dry", but alcohol must be limited to the personal accommodation spaces. Smoking (tobacco and cannabis) is not permitted on Queen's property. Students are expected to not be under the influence of any non-prescription substances during course work hours. Missed work, e.g. due to hangovers, will not be able to be made up. Students are further encouraged to behave responsibly.
(k) Vaccinations/ Insurances	This course is offered on a university campus in Ontario. As such, no special insurance or vaccinations are required. We are within 911 coverage in the case of emergencies. Students are reminded to bring their health care cards.
(l) Social Situations	Students will be spending 2 weeks together in fairly close quarters and working on group research projects. We plan to have access to a firepit at night, and everyone is encouraged to mingle with other QUBS users outside of our active hours.  Harassment of, or violence towards, other students or users of the facilities will not be tolerated. Any incidents should be immediately reported to your instructor, another instructor present at QUBS, or the station management, all of whom will be identified to you on the first day of the course. Appropriate actions will be determined by QUBS management to ensure the safety and security of all present.
(m) Final comments	This course has been very well received by past students, and while we do have academic components to cover, we will also spend as much time as possible outside (weather permitting) and students will have the opportunity to develop and perform their own group research projects during the second week based on questions and activities that were found to be enjoyable. It will be early and the water still chilly, but QUBS has a diving board, canoes, and a sports field with volleyball net.

