

Course Title:	Urban Water Ecosystems	
Instructor(s):	Dr. Stephanie Melles stephanie.melles@ryerson.ca	
Dates:	Aug 2 - 16, 2020	
Location:	Ryerson University. Students will be housed at the new Daphne Coxwell Centre on Church Street. Fieldwork will occur in the City of Toronto at a selection of locations: Tommy Thompson Park, the Don River watershed, Toronto Island, the Rouge River National Urban Park, and Highland Creek Park (Rouge Hill GO Train station). Other possible excursions to wetlands, wastewater treatment plants, sewage lagoons, and water treatment plants may occur (e.g., Highland Creek Treatment Plant, Stevenson Swamp, Ashbridges Bay Water Treatment).	
Cost:	<p>Course Fees: \$1300 includes accommodation for 13 nights, lunch & dinner x 12, and pre-loaded presto transit cards for travel to and from field sites. Payable as \$350 non-refundable deposit to your home university, and \$950 balance to Ryerson University. The balance is due by May 1st payable by cheque to: Ryerson University.</p> <p>Mail to: Caltha Rimmer, Administration Manager, Chemistry and Biology, Kerr Hall (KHN210), Ryerson University. 350 Victoria Street, Toronto, Ontario M5B 2K3.</p>	
Prerequisites:	Academics: students should be entering minimally their 3rd or 4th year of a Biology, Env. Sci., or similar program; and have at least (a) one advanced ecology course beyond the introductory level, and (b) one biometry or statistics course.	
Enrolment*:	Up to 20 (8 reserved for Ryerson students)	
Course Description (brief):	<p>This course will provide participants with opportunities to learn basic field biology skills (sampling methods and identification) in the City of Toronto with a focus on urban water systems. Students will gain an ability to accurately and reflectively characterize field observations; they will learn basic sampling and sampling design techniques; and they will design and collect data for their own scientific experiment. Course goals will be achieved through engagement in field-based observations, sampling, and through the application of practical skills during excursions to urban water sites in and around the City of Toronto, with a focus on the Rouge National Urban Park. Students will present their independent or small group research project during in-class workshops or seminars.</p> <p>At the end of the course, a successful student will be able to:</p> <ol style="list-style-type: none"> 1. Perform basic water quality measurements and observations at a variety of sites 2. Characterize biotic and abiotic components of urban water ecosystem (e.g., components of stream, wetland, pond, lake) 3. Survey urban water ecosystems. Students will learn techniques to sample and identify organisms in the following taxonomic groups: riparian birds, fish, and aquatic invertebrates. 4. Assess aspects of habitat for a variety of species and taxonomic groups 5. Design and conduct ecological field experiment(s) employing various sampling designs 6. Present scientific hypotheses and experimental design elements 	
Evaluation:	<ul style="list-style-type: none"> • Field Journal Exercise(s) (individual) • Data collection, entry/processing, and interpretation via homework (individual) • Group research project proposal and presentation (teams of 3) • Participation (evaluation completed by professor, TA, and team peers using a specific evaluation form) • Final report (7-10 pages, to be submitted four weeks after the field course) 	<p>15%</p> <p>15%</p> <p>20%</p> <p>10%</p> <p>40%</p>

An Average Day – What to Expect

(a) Daily timeline	The average day will start at 7:00 or 8:00 with travel to field site, 9:00 field work rain or shine, 12:00 lunch break, 1:00 continuing field work, 5:00 travel back from field site, 6:00 dinner, 8:00-9:30 pm (sample processing, class lectures, data preparation, log book updates, student presentations). However, earlier or later start/end times are possible.
(b) Work habitat & Physical exertion	Students should be prepared for physical exertion (e.g., daily hiking up to 10-15 km) with backpack necessities; 8 hrs/day sometimes in muddy/wet conditions, wadable streams, shorelines, wetlands, wearing hip-waders; long daylight hours with minimal toilet facilities. (e.g., water breaks, rest periods, and bathroom breaks will be scheduled where possible).
(c) Common activities	<ul style="list-style-type: none"> • common rain or shine activities (e.g., wading in shallow water, traversing wetlands, hiking in riparian areas, walking along trails, lab sample processing, long days) • associated risks (e.g., ticks that carry Lyme disease, dehydration, getting lost, sunburn, twisted ankles, fatigue, blisters from poor footwear, heat exhaustion, hypothermia). Appropriate field safety measures will be taken, and students will be advised about appropriate procedures, equipment, and supplies (e.g., precautions about Lyme disease)
(d) Weather, dehydration, & biting insects	<ul style="list-style-type: none"> • Weather conditions likely to be encountered will reflect Toronto temperatures and conditions. • June in Toronto can be variable with temperatures ranging from 15 to 25 degrees. Prepare for cool days on the lakeshore (hat/ jacket), rainy days (rain jacket), and hot sunny days in the park with little cover (sunhat/sunblock). • Please be aware that you will experience insects (e.g., 24/7 mosquitoes, blackflies, no-see-ums, sand flies, deerflies, and horseflies). Long sleeve shirts and pants are recommended even on hot days. Hiking boots or sturdy footwear and rainboots are required.
(e) Toxic/poisonous, wildlife/ plants	Ticks that carry Lyme disease, mosquitoes, West Nile virus, bees/wasps, poison ivy, Giant hogweed, poison oak, stinging nettle. The most common poisonous plant encountered will be poison ivy. You will be taught how to identify it and avoid it. It is very unlikely that we will encounter Giant hogweed, but it is possible. Ticks that carry Lyme disease are also possible.
(f) Sleeping, washroom & laundry facilities	<ul style="list-style-type: none"> • Sleeping accommodations in downtown Toronto 4-bedroom, gender specific, student apartments with private rooms and two bathrooms, fridge, and kitchenette (no stove or hotplate). There is a shared community space on the 8th floor that has a cooking area with refrigerators, sinks, and two stoves, as well as a TV and seating area. Daily housekeeping service included. • Bed linen and towels provided (hotel style - hair dryer, iron and ironing board available at front desk for allotted time periods for each use) • Complimentary wireless high-speed internet (Wi-Fi) available throughout the residence. • Laundry machines available on the main residence floor (The cost for each wash is \$2.00 and \$1.50 for each dry)
(g) Meal plans & food allergies	Meal plan includes a box lunch and entrée dinner for \$35.25/day which is included in course fees. Students will need to arrange for their own breakfast items. For meal plan lunch and dinner arrangements, let us know early of any allergens or food requirements.
(h) Non-academic responsibilities	Students must abide by the Ryerson Student Code of Non-academic Conduct https://www.ryerson.ca/senate/policies/pol61.pdf
(i) Degree of isolation	We will have all the benefits of being housed in downtown Toronto. However, during daily field excursions, we will be relatively isolated (e.g., in the Rouge Valley National Urban Park ~30 minutes away) and washrooms will not be readily available.
(j) Alcohol & drugs	Alcohol and legal marijuana will be permitted during off hours so long as appropriate code of conduct is adhered to. Ryerson Policy 61, C12 https://www.ryerson.ca/senate/policies/pol61.pdf
(k) Vaccinations/ Insurances	See: https://www.toronto.ca/community-people/health-wellness-care/health-programs-advice/immunization/immunization-for-adults/ Travel insurance is highly recommended and may be required (TBD).
(l) Social Situations	Be prepared for living in close quarters, working in groups, long days with little to no down time, and being surrounded by students with different cultural backgrounds than your own. It is the shared responsibility of all community members to foster a welcoming, supportive and respectful learning, teaching, research, and work environment. See: https://www.ryerson.ca/equity/
(m) Final comments	This course will provide you with a good introduction to field methods in applied ecology related to aquatic ecosystems in the heart of Canada's largest city. You will learn to perceive and appreciate this diverse urban environment in entirely new ways. Field courses can change your life!