ENV 316 - Laboratory and Field Methods in Environmental Science

This course focuses on methods of sampling and analyzing physical properties, and chemical and biological constituents of air and water. It will integrate topics from chemistry, and ecology. Techniques in field sampling, laboratory analyses, and analyses of large environmental data sets will be covered. Students will also learn about sampling design strategies to deal with spatial and temporal representativeness.

Time and Place: The course meets in person, usually in RW109 from 1-5 pm every Friday (but check the weekly schedule as rooms may differ depending on the activity). The first class will be offered online on Zoom. Sessions will usually consist of an approx. 1-hr lecture and a 1-hr tutorial, followed by 2hrs of independent work with instructors present.

Instructors:	Njal Rollinson, njal.rollinson@utoronto.ca	(Ecol & Evol Biology)
	Hui Peng, hui.peng@utoronto.ca	(Environmental Chemistry)
TAs:	Claudia Lacroix, claudia.lacroix@mail.utoronto.ca	(Ecol & Evol Biology)
	Diwen Yang, diwen.yang@mail.utoronto.ca	(Environmental Chemistry)

Office hours: Can be scheduled by appointment by emailing the appropriate instructor or TA, or as otherwise stated in the first class on September 9th.

Website: We will communicate with you using the course Quercus site. You are responsible for consulting it regularly for updates and to access readings.

Textbook: There is no textbook for the course. We will provide resources and links to readings on the course Quercus site.

Evaluations:

Environmental Chemistry	**50%**
Two assignments: (5%, 5%)	10 %
Project presentation	15 %
Final chemistry project report	25 %
Ecology	**50%**
Two R assignments: (3%, 8%)	11 %
Two Ecology reports (12 % each)	24 %
Final Ecology project (15% write up)	15 %

Final Environmental Chemistry Project: You will apply skills and concepts developed in virtual chemistry labs, to interpret the results and relate the data to background knowledge of corresponding pollutants. You will be expected to coordinate with group members to discuss the results, interpret the data and deliver the presentation. The written component will be 2500 words maximum, in addition to relevant tables, figures, and references. The final project report is due on Nov 6th.

Final Assessment in Ecology (Ecology Project): You will apply skills and concepts developed in the course to an Ecology issue while working with a large dataset. The written component will be approximately 1000 words, in addition to relevant tables, figures, and references. Further details will be given in class. The final project is due on October 28th.

Late work policy: The due dates of assignments and essays are outlined below. Work handed in late will be penalized at 10% per day, including the weekend, starting at 1:10 pm (the start of class, except where noted) on the due date. All work can be submitted online.

Date	Week	Lab Activities	Location	Due date for
Sep 9	1	Introduction to Course, to statistics and sampling; R Tutorial 1	RW109 /NR	
Sep 16	2	Field Trip to Humber River	Humber River /NR	R Homework 1
Sep 23	3	R Tutorial 2; OBBN Lecture, Identify Benthics;	RW109 (1-3pm) ESC3087 (3-5pm) / NR	
Sept 30	4	Ecology data analysis 1; Intro to Ecology Proj	RW109 /NR	R Homework 2
Oct 7	5	Ecology data analysis 2	RW109 /NR	Ecology 1
Oct 15	6	Face time for help with Final Project; Ecology Assignment 2	RW109 /NR	Ecology 2 (due at end of class)
Oct 21	7	Environmental chemistry and toxicology in the big data era	RW109 /HP	
Oct 28	8	Chromatography and computation Chemistry lab (lab tour and OPFR analysis)	LM113 /HP	Final Project Ecology
Nov 3	9	Chemistry lab (plastic product analysis)	LM113 /HP	
Nov 11		Reading Week		
Nov 18	10	Mass spectrometry and computation I (non-targeted analysis)	RW109 /HP	Chemistry assignment 1
Nov 25	11	Mass spectrometry and computation II (non-targeted analysis)	RW109 /HP	
Dec 2	12	Final presentation	RW109 /HP	Due on Dec 11 Chemistry assignment 2 &Final report

Academic Integrity: While discussions among classmates are encouraged, any material that you submit or present MUST represent your own independent work and comprehension.
Information about academic integrity can be found here: http://www.artsci.utoronto.ca/osai/
A copy of U of T's Code of Behaviour on Academic Matters can be found here:
http://www.governingcouncil.utoronto.ca/Assets/Governing+Council+Digital+Assets/Policies/PDF/ppjun011995.pdf

Helpful advice on how not to plagiarize can be found here: http://advice.writing.utoronto.ca/using-sources/how-not-to-plagiarize/. Please read this documentation.

Accommodations: Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability or health consideration that may require accommodations, please feel free to approach one of the instructors and/or Accessibility Services at (416) 978 8060; http://accessibility.utoronto.ca

Website and Online Interfaces: All material for both class and lab will be provided through Quercus. You are responsible for checking this site regularly. Synchronous classes and labs will be conducted over Blackboard collaborate. Specific details for each meeting will be provided on Quercus.

Technological Requirements : This course requires the use of computers. It is imperative that students are able to download the free statistical program R (https://www.r-project.org/); students will not be able to complete course assignments without access to R. It is also advisable that students use R studio (https://rstudio.com/products/rstudio/download/), as this program facilitates the use of R.

You are responsible for ensuring that you maintain regular backup copies of your files, use antivirus software (if using your own computer), and schedule enough time when completing an assignment to allow for delays due to technical difficulties. Computer viruses crashed hard drives, broken printers, lost or corrupted files, incompatible file formats, and similar mishaps are common issues when using technology, and are not acceptable grounds for a deadline extension.

Specific guidance from the U of T Vice-Provost, Students regarding student technology requirements is available here: https://www.viceprovoststudents.utoronto.ca/covid-19/tech-requirements-online-learning/

Advice for students more broadly regarding online learning is available here: https://onlinelearning.utoronto.ca/getting-ready-for-online/

Absences: Students who are unable to attend Friday at 1-5pm are responsible for making up the missed material. Students should use the ACORN self-declaration system to report absences. Students who miss a deadline should contact Professor Rollinson or Professor Peng ahead of missing the deadline, or as soon as possible, and no later than one week after returning to class.