



University of Toronto-Scarborough  
Department of Physical and Environmental Sciences  
**EESC33H3 Environmental Science Field Course - Fall 2017**

Instructor: **Prof. Mathew Wells**, ESCB 456, phone: 416 208 4879, [wells@utsc.utoronto.ca](mailto:wells@utsc.utoronto.ca)  
Teaching Assistant: Patricia Semcesen  
Lectures: Thursday, 9 am –11 am (Room BV 466)

**Overview:**

- The course EESC 33 consists of 4 days of field trips outside of class.
- Students will learn how to collect, analyze and interpret a series of physical, chemical and biological parameters from lakes. We will spend a lot of time on boats and in the water collecting samples. We will use the U of T labs to process these samples, and physical data will be analyzed during class.
- A major focus of the class will be learning how to process relevant data that we collect using Excel as well as the open source coding language Python (<https://www.python.org/>). The codes will be described in class, and students will use this to plot class data, as well as data from other sources such as government moorings in Lake Ontario (<http://ontario2.loboviz.com/>) and Lake Erie (<http://ontario3.loboviz.com/>).
- Classes will be a mix of lectures and hands-on data analysis on computer in a room in the BV wing.
- Emphasis will be put on how physical processes (e.g., thermal structure of the lake, surface and internal waves, currents) affect the distribution of organisms (algae, invertebrates, fish) and biological processes in the waters lakes in Southern Ontario.
- Students will gather class data and work together to complete a small class project, and will responsible for completing an independent report based on field work. By the end of the course you should be familiar with the standard field techniques to measure water quality.
- There will be a fee of \$300 to cover transport, boat rental and accommodation costs of the field trips.

**Marking Scheme:**

- Participation & Performance (individual): 20% (15% for field trip, 5% for classes)
- Group presentations of class field data - 20%
- Assignment 1 - 10%
- Assignment 2 - 10%
- Individual research talk and paper - 40%

**Tentative Lecture & field trip Schedule** - Subject to change:

**Hamilton Harbour trip** - Thursday 31st August. My TA and I will I will drive students in vans there and back to UTSC. We will leave very early from UTSC to be on water at 7.30 am in Hamilton and will be back mid afternoon. It nominally takes 1:15 to get there, so I think we need to leave by 6am from outside the Environmental Science and Chemistry Building at 1065 Military Trail. See map at

<https://goo.gl/maps/rpd9drtb8Mr>

**Toronto Harbour Trip** - Friday 1st September. Students will make their own way from Union station to be at Queens Quay docks by 8.30 am. It is a short walk - see <https://goo.gl/maps/YFcw6u7FiS82> . We have the boat for 3 hours, and will do some analysis on docks. We will finish by 1 pm.

There will be no class on **7th September** so that you will have plenty of time to insure you have packed all the needed field equipment.

**Algonquin Park** trip on the weekend of 8-10th September. We will drive up to the park from UTSC in two vans, leaving at 2 pm on Friday to arrive by 6pm. It is 3:30 driving, and we'll plan to have a brief stop in Bancroft on way there (<https://goo.gl/maps/zd8iTdXfUQm>). I will aim to return by Sunday afternoon, i.e. leaving after lunch on Sunday.

#### **14<sup>th</sup> September – Week 2**

Short lecture on thermal stratification classification and light profiles.  
Discussion of field data, and assignment of groups for group presentation.

#### **21<sup>st</sup> September – Week 3**

Short lecture on water quality and dissolved oxygen.  
**Assignment 1 issued** – light profiles and temperature profiles, due following week.

#### **28th September – Week 4**

**Guest lecture** on data analysis in Georgian Bay by Dr. Lakshika Ralahamill  
Using google maps in presentation. Examples from class data.

#### **5<sup>th</sup> October – Week 5**

**Group presentations** on field data collected in Algonquin Park, Hamilton Harbour and Toronto Harbour.

#### **12<sup>th</sup> October – Reading week**

#### **19<sup>th</sup> October – Week 6**

Short lecture on understanding upwelling events.  
Plotting temperature profiles in Python – examples from Lake Opeongo and Lake Ontario.

#### **26<sup>th</sup> October – Week 7**

Laboratory demonstrations in my lab (EV002) of stratified fluid dynamics  
**Assignment two issued.** Data analysis of telemetered data from Loboviz or other stations.

#### **2<sup>nd</sup> November – Week 8**

Plotting contour plots in Python – examples from Lake Opeongo and Lake Ontario.

#### **9<sup>th</sup> November – Week 9**

Plotting weather data in Python – examples from Lake Opeongo and Lake Ontario.

#### **16<sup>th</sup> November – Week 10**

Class will be a tutorial for discussion of final presentations.

#### **23<sup>rd</sup> November – Week 11**

Final 15 minute presentations from students (7 talks over 2 hours).

## 30<sup>th</sup> November – Week 12

Final 15 minute presentations from students (7 talks over 2 hours).

**Research Help:** University of Toronto Scarborough Library Staff at the UTSC Library will be happy to help you find the resources you need for your assignments, and learn the research skills you will need for success at university. Research help is available by phone, e-mail, chat, or in-person in the Library.

For more information, please see the Library's Help Guide for UTSC Students:

[http://guides.library.utoronto.ca/utsc\\_help](http://guides.library.utoronto.ca/utsc_help)

Need in-depth or department specific assistance? Contact Sarah Forbes, Liaison Librarian for Physical and Environmental Sciences: <http://uoft.me/smforbes>

### **Blackboard:**

Lecture and lab material will be posted on and Online Quizzes will be done through blackboard. Please check daily for updates (e.g. assignments, announcements etc.).

Blackboard: <https://portal.utoronto.ca>

### **Academic Integrity Statement:**

Academic integrity is one of the cornerstones of the University of Toronto. It is critically and important both to maintain our community which honours the values of honesty, trust, respect, fairness and responsibility and to protect you, the students within this community, and the value of the degree towards which you are all working so diligently. According to Section B of the University of Toronto's Code of Behaviour on Academic Matters, which all students are expected to know and respect, it is an offence for students:

- to use someone else's ideas or words in their own work without acknowledging that those ideas/words are not their own with a citation and quotation marks, i.e. to commit plagiarism.
- to include false, misleading or concocted citations in their work.
- to obtain unauthorized assistance on any assignment.
- to provide unauthorized assistance to another student. This includes showing another student completed work.
- to submit their own work for credit in more than one course without the permission of the instructor.
- to falsify or alter any documentation required by the University. This includes, but is not limited to, doctor's notes.
- to use or possess an unauthorized aid in any test or exam.

There are other offences covered under the Code, but these are by far the most common. Please respect these rules and the values, which they protect. It is your responsibility to ensure that your work maintains academic integrity. If you have any concerns please see the instructor before a potential problem arises. Please familiarize yourself with the Code

(<http://www.governingcouncil.utoronto.ca/policies/behaveac.htm> At the University of Toronto academic dishonesty can result in a mark of zero, a reduction in final grades, denial of privileges, a monetary fine, failure in the course, suspension, permanent record, a recalling of degrees/diplomas and certificates, or expulsion.

### **Accessibility Needs:**

The University of Toronto is committed to accessibility. If you require accommodations for a disability, or have any accessibility concerns about the course, the classroom or course materials, please contact

Accessibility Services as soon as possible: UTSC campus AccessAbility

<http://www.utsc.utoronto.ca/~ability/> or St. George Campus DisAbility  
[disability.services@utoronto.ca](mailto:disability.services@utoronto.ca) or <http://studentlife.utoronto.ca/accessibility>.