

## Department of Biology Course Outline

BIOL/ENVB 3280, Freshwater Biology  
Fall 2017

### Course Description

The study of physical, chemical, and biological aspects of freshwater aquatic ecosystems, with a focus on lake systems. Laboratory deals with taxonomy of freshwater organisms, use of limnological equipment, and analysis/interpretation of aquatic data. Three lecture hours, three laboratory hours. One term.

### Prerequisites

Prerequisites: SC/CHEM 1000 3.00 and SC/CHEM 1001 3.00, SC/BIOL 2050 4.00 and SC/BIOL 2060 3.00.

Note: SC/PHYS 1510 4.00 or equivalent (OAC Physics, 12U Physics) is strongly recommended.

Course Credit Exclusion: SC/BIOL 4080 3.00/4.00, SC/ENVB 4080 3.00/4.00

### Course Instructors and Contact Information

Instructor: Dr. Richard Vogt

Email: [vogtr@yorku.ca](mailto:vogtr@yorku.ca)

Office Hours: Office hours will be kept according to appointments made by students by prior arrangement. To set appointments, please contact the instructor by email, or make arrangements before or after lecture.

### Schedule

Lectures: Monday, Wednesday, Friday (60 min) @ 10:30

Labs: Friday (180 min) @ 14:30

### Evaluation

15% - Three Lab assignments (5% each)  
15% - Lab Exam (*or 7-9 page essay topic*)  
20% - Mid-term 1  
20% - Mid-term 2  
30% - Final Exam

Note: Final course grades may be adjusted to conform to Program of Faculty grades distribution profiles.

## Important Dates

Fall Reading Days: Oct 26-29  
Last Date to submit Fall Term Work: Dec 5  
First Class – September 8  
First Lab – September 22  
Last Class – December 4

Lab Assignment 1 – October 6  
Lab Assignment 2 – October 20  
Lab Assignment 3 – November 10

Midterm 1 – October 11  
Midterm 2 – November 8

Final Exam – Exam Period is Dec 6-21. Date of final exam is set by the Registrar's office.

NOTE: for additional important dates such as holidays, refer to the "Important Dates" section of the Registrar's Website at <http://www.yorku.ca/yorkweb/cs.htm>

## Resources

There is a course Moodle site, on which readings and lab updates will be posted. Readings will be either research articles (which are available online via York's library system) or textbook chapters (which will be provided as a .pdf or .html). There is no textbook that you are required to purchase for this class.

## Learning Outcomes

Upon successful completion of this course, students should be able to:

1. Understand core concepts associated with physical, chemical, and biological aspects of freshwater aquatic ecosystems.
2. Understand the key terminology for describing freshwater habitats
3. Conduct an aquatic site assessment and collect and identify biological specimens for lake/pond ecosystems.
4. Competently use limnological sampling equipment for biological collections and for sampling water and sediments.
5. Understand in context the ramifications of human impacts for freshwater ecosystems, including impacts of climate change.
6. Interpret the thermal structure of water, physical water currents, and their relevance to the biology, chemistry and physics of bodies of water
7. Describe patterns and dynamics of dissolved oxygen, salinity, nutrients, pH, and dissolved inorganic carbon in water bodies, and influences on aquatic ecosystems.
8. Understand the ecology of major groups of phytoplankton, zooplankton, and benthos, including their seasonal dynamics and the major environmental gradients that structure their communities.
9. Characterize the basic structure of aquatic food webs.

## Course Content

This course will develop a comprehensive and integrated understanding of physical, chemical, and biological processes that occur within lakes. Biological communities are shaped by aspects of the physical and chemical habitats, and this course will identify important abiotic drivers of biological communities, and will describe how environmental change and anthropogenic stressors are expected to influence aquatic ecosystem functioning.

General topics covered in this course include:

### ***Physical Limnology:***

Origin of Lakes  
Lake Morphometry  
Light  
Heat & Temperature  
Movement of Water Within Lakes

### ***Chemistry:***

Dissolved Oxygen  
Salinity  
pH and inorganic carbon  
Nutrients: Phosphorus, Nitrogen, and Micronutrients

### ***Biota***

Phytoplankton  
Zooplankton  
Benthos  
Fish & Food Webs

### ***Topics of Interest***

Eutrophication  
Primary production  
Macrophytes  
Littoral Zone Ecology  
Biodiversity & Ecosystem Functioning

### **Laboratory Schedule:**

Lab 1 – Description of equipment and habitat assessment (Sep 22)  
Lab 2 – Habitat mapping at pond (Sep 29)  
Lab 3 – Zooplankton collection & ID (Oct 6)  
Lab 4 – Benthos collection & ID (Oct 13)  
Lab 5 – Algae collection & ID (Oct 20)  
Lab 6 – Preserved specimen ID (Nov 3)  
Lab 7 – Map and profile interpretation (Nov 10)  
Lab Exam – (Nov 17)

## Experiential Education and E-Learning

Students will have the opportunity to work hands-on with field sampling equipment in a field environment. Field labs will focus on site assessment, specimen collection and identification

## Course Policies

If an in-class exam is missed for a valid, documented reason, the student will not receive a 0 grade if the following conditions are met: (1) the course director is notified within one week, and (2) all relevant documents are provided within one week, ideally at the next lecture.

To ensure fairness, all assignments are due on the dates specified, and a 20% penalty will be applied the first day an exercise is late, with a 5% penalty provided for each additional day.

Students are discouraged from recording lectures or lab tutorials using their own devices.

## Other Information

Expectations: Attendance of lectures is mandatory because they will provide an opportunity to interact with the lecture material via class discussion. While the content of the slides will provide minimal requirements for testing, information and insights that emerge from class discussion during lectures is considered potentially testable.

## University Policies

### Academic Honesty and Integrity

York students are required to maintain the highest standards of academic honesty and they are subject to the Senate Policy on Academic Honesty (<http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/>). The Policy affirms the responsibility of faculty members to foster acceptable standards of academic conduct and of the student to abide by such standards.

There is also an academic integrity website with comprehensive information about academic honesty and how to find resources at York to help improve students' research and writing skills, and cope with University life. Students are expected to review the materials on the Academic Integrity website at - <http://www.yorku.ca/academicintegrity/>

### Access/Disability

York University is committed to principles of respect, inclusion and equality of all persons with disabilities across campus. The University provides services for students with disabilities (including physical, medical, learning and psychiatric disabilities) needing accommodation related to teaching and evaluation methods/materials. These services are made available to students in all Faculties and programs at York University.

Students in need of these services are asked to register with disability services as early as possible to ensure that appropriate academic accommodation can be provided with advance notice. You are encouraged to schedule a time early in the term to meet with each professor to discuss your accommodation needs. Please note that registering with disabilities services and discussing your needs with your professors is necessary to avoid any impediment to receiving the necessary academic accommodations to meet your needs.

Additional information is available at the following websites:

Counselling & Disability Services - <http://cds.info.yorku.ca/>

Counselling & Disability Services at Glendon - <http://www.glendon.yorku.ca/counselling/personal.html>

York Accessibility Hub - <http://accessibilityhub.info.yorku.ca/>

### Ethics Review Process

York students are subject to the York University *Policy for the Ethics Review Process for Research Involving Human Participants*. In particular, students proposing to undertake research involving human participants (e.g., interviewing the director of a company or government agency, having students complete a questionnaire, etc.) are required to submit an *Application for Ethical Approval of Research Involving Human Participants* at least one month before you plan to begin the research. If you are in doubt as to whether this requirement applies to you, contact your Course Director immediately.

### Religious Observance Accommodation

York University is committed to respecting the religious beliefs and practices of all members of the community, and making accommodations for observances of special significance to adherents. Should

any of the dates specified in this syllabus for an in-class test or examination pose such a conflict for you, contact the Course Director within the first three weeks of class. Similarly, should an assignment to be completed in a lab, practicum placement, workshop, etc., scheduled later in the term pose such a conflict, contact the Course director immediately. Please note that to arrange an alternative date or time for an examination scheduled in the formal examination periods (December and April/May), students must complete an Examination Accommodation Form, which can be obtained from Student Client Services, Student Services Centre or online at

[http://www.registrar.yorku.ca/pdf/exam\\_accommodation.pdf](http://www.registrar.yorku.ca/pdf/exam_accommodation.pdf) (PDF)

### **Student Conduct in Academic Situations**

Students and instructors are expected to maintain a professional relationship characterized by courtesy and mutual respect. Moreover, it is the responsibility of the instructor to maintain an appropriate academic atmosphere in the classroom and other academic settings, and the responsibility of the student to cooperate in that endeavour. Further, the instructor is the best person to decide, in the first instance, whether such an atmosphere is present in the class. The policy and procedures governing disruptive and/or harassing behaviour by students in academic situations is available at - <http://secretariat-policies.info.yorku.ca/policies/disruptive-andor-harassing-behaviour-in-academic-situations-senate-policy/>