

Objectives:

This course examines advanced concepts associated with the design and implementation of experiments in environmental and evolutionary biology. Both basic and applied designs are described and major contemporary developments summarized. The following objectives will be addressed through readings, lectures, discussions, and labs.

1. Explain the relative importance of experimental design and the value of powerful experiments in addressing evidence-based scientific issues.
2. Describe the difference between research questions, hypotheses, and predictions and effectively develop each for any topic.
3. Critically evaluate experiments in environmental and evolutionary biology and identify limitations and improvements to a given design.
4. By carrying out laboratory work on experimental design, demonstrate an understanding of the different approaches used to observe patterns in environmental and evolutionary biology and to generate hypotheses.
5. Conduct a systematic review on a topic of your choice.

Instructor:

Dr. Christopher Lortie
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Lab administrator:

Alex Filazzola
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Prerequisites:

SC/BIOL2060 or an equivalent statistics course.

Online resources:

Twitter: #yudesign, blog: www.experimentaldesigns.org

Office hours:

- (i) Available 1030-1130am W & F in LB 218.
- (ii) By appointment.

Time & location:

Lectures: Thurs at 1130a in SLH C.
Labs: WRF at 230-530p in LSB105.

Important student information:

Please see the following link for the academic honesty:
<http://www.yorku.ca/univsec/policies/document.php?document=69>

Specific policy on assignments:

Late assignments will not be accepted without explicit *a priori* permission of the instructor.

Structure:

The lectures will be a mix of both formal lecture and discussion to ensure that each topic is mastered. The textbook is fantastic so please read it. My job is to facilitate your understanding of the readings and highlight the main points. Show up, work hard, do the weekly readings, and the concepts will link to other ideas more easily. A collection of peer-reviewed publications will be provided in lectures as well.

Readings:

The required textbook for the course is 'Experimental design for the life sciences', third edition, by Ruxton & Colegrave, Oxford University Press.

Evaluation:

Term test #1.	25%
Term test #2.	25%
Lab report	25%
Systematic review	25%

Evaluation metrics:

The two term tests are short to long answer during the regular lecture slot. The lab report is a standard scientific paper style report summarizing the design and findings of the experiment you designed. The systematic review is a standard format scientific systematic review conducted during the latter term lab slots.