

BIOL 7050: "Experimental Design and Biological Data Analysis", Fall 2021

Dr. Brad Bergstrom
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8-9:15 am TR, 1202 BSC
Offc Hrs M 2-4:30 pm, T 9:30 am-12 noon; other
times by appt.

1107 BSC, 333-5770

Required Text: **Whitlock, M.W., and D. Schluter. 2015. The analysis of biological data. 2nd ed. W. H. Freeman, New York.** (*I chose this text for its readability, comprehensiveness, and links to numerous resources that you may use for years to come; I expect you will purchase and keep this book as an important reference in your career.) Bring your book to class!

Overview: the format will be a combination of lecture, hands-on data collection and analysis (with graded write-ups), regular homework assignments (due every Thursday), a few quizzes, and some discussion of papers. There will also be a component of individualized design of an experimental protocol, whether that represents your actual Masters research or other proposed project. An initial

¹You will find several resources for this course on Blazeview.

We will have the Biology Computer lab reserved for Thursdays and will meet there on some weeks but in the classroom other Thursdays (I'll inform you that Tues which it will be). If you have your own laptop, with Microsoft Excel installed, you may use it (but everything you need is on the computer lab computers, and you will not be able to download Minitab onto your laptop).

Notes on Final Experimental Design Protocol: this will be, essentially, an Introduction and Methods (with partial Literature Cited) of a scientific paper, with emphasis on: 1) justifying your specific hypotheses in the context of your species/system, with preliminary literature review, and 2) specifying the precise methods and all details for sampling, including manipulating explanatory variable(s), measuring effect on response variables, and specific statistical tests needed. Give details of replicates, sample size (do calculations of n needed for particular power and precision desired), temporal, ecological, spatial scope of study, grain of sampling units, etc. Also specify types of graphs that will be used to display data. Unlike the Methods section of an actually published paper (which is written in past tense), you may write this in future tense, because it is a proposal for what you *will* do.

Points and Grading:

Initial Questionnaire	30
Collegial Review	15
15 Homeworks @ 10 pts	150
3 Quizzes @ 25	75
Lab analyses	30
Class Discussion	10
Final Design Protocol	50

TOTAL	360

Lowest A/B/C = 320/285/250

Links and other resources:

Textbook Website: <http://whitlockschluter.zoology.ubc.ca/>

Calculate sample sizes for Power and Precision in Experimental Design:
<http://www.divms.uiowa.edu/~rlenth/Power/>

Random number generators: several smart phone Apps, including "Random Pro"
(But, also download the "Analysis ToolPak" Add-in to your copy of Excel, then activate it in the Analysis group on the Data tab).

