DESIGN OF FISH AND WILDLIFE PROJECTS (FW 370)  
Fall Semester, 2014

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TEXTS:  Gotelli and Ellison (2013) A Primer of Ecological Statistics (Required)  
McMillan (2011) Writing Papers in the Biological Sciences (Recommended)

GENERAL
The purpose of this course is to introduce you to the general principles of conducting research in fish, wildlife and conservation biology. The course format will include lectures, discussion of papers from the primary literature and laboratory exercises designed to improve your understanding and appreciation of statistics. The course will emphasize philosophy and history of science, application of the scientific method in ecological research, preparation of research proposals, experimental design, data collection/analysis, scientific writing and scientific communication.

CLASS DISCUSSION
In addition to the assigned readings from Gotelli and Ellison, we will also discuss papers from the primary literature. Papers for these discussion sections will emphasize philosophy of science and the importance of using the scientific method in fishery and wildlife research. These papers have been placed on RAM CT Blackboard and are accessed using you E-ID. To participate in discussion sections it is essential that you read these materials prior to class.

RESEARCH PROPOSALS
A research proposal (15-20 pages) describing a fish, wildlife or conservation biology investigation is required. Students will work in teams of 2-3 to develop the proposal. The proposal will include a comprehensive literature review, a statement of the hypothesis being tested, justification for the importance of conducting the proposed research, detailed methods including statistical analyses, expected results, and a budget (not to exceed $150 K per year). Examples of previous proposals and other information are posted on Blackboard.

POSTER PRESENTATIONS
During the last week of class, each team will develop a poster presentation describing and defending their proposed research. Poster presentations are open to graduate students and faculty in the department.

GRADES
Participation in Discussion, Lab Assignments & Homework……… 25%
Midterm Exam……………………………………………………………………………… 25%
Proposal Abstract, Introduction, and Lit. Cited……………………… 15%
Final Research Proposal………………………………………………………… 25%
Poster Presentations………………………………………………………… 10%
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Date   Topic
8/25   Introduction, Course Objectives and Expectations
8/27   History and Philosophy of Science; Use and Abuse of the Scientific Method

9/1     Labor Day- No Class
9/3     Hypothesis Testing in Ecological Research
        (Gotelli & Ellison, Chapter 4; On the practice of ecology, Weiner 1995)

9/8 & 9/10  Discussion- Philosophy of Science  (Conjectures and refutations, Karl
           Popper, 1953; Strong inference, Platt, 1964)

9/15   Fundamentals of Experimental Design (Gotelli & Ellison, Chapters 6 & 7)

****Proposal Topics Due****
9/17   Introduction to Descriptive Statistics (Gotelli & Ellison, Chapter 3)

9/22 & 9/24  Stats Lab 1: Sample Means, Standard Deviation, and Sample Size

9/29   Introduction to Inferential Statistics (Gotelli & Ellison, Chapters 9 and 10)
10/1   Analysis of Variance (ANOVA)

****1-Page Pre-Proposals Due****

10/6 & 10/8  Stats Lab 2: T-Tests and One-way ANOVA

10/13  Two-Way ANOVA and other Factorial Designs
10/15   Linear Regression

10/20 & 10/22  Stats Lab 3: Two-way ANOVA and Linear Regression

10/27   Assumptions and Alternatives to Parametric Statistics
10/29   Experimental Design Revisited  (Science, scientists and policy advocacy, Lackey, 2007)

****Abstract, Introduction, & Literature Cited Sections Due ****

11/3   Scientific Writing and Oral Presentations (McMillan, Chapters 1, 3, 4)
       (Statistical inference, type II error and the endangered species act, Brosi & Biber, 2009)
11/5   Research Proposals (Readings: McMillan, Chapters 6, 7, 8)

11/10 & 11/12  Stats Lab 4: Ecological Applications

11/17  Preparation of Posters and Final Research Proposals
11/19   Exam

11/24 & 11/26  Thanksgiving Break

12/1 & 12/3  Preparation of Posters and Final Research Proposals
12/8 & 12/10  Presentations of Posters and Final Research Proposals
*****Final Proposals Due 12/12 @ 5:00 p.m.*****