Course Meeting Times/Places: Tu/Th 10-11:40, Wagar 107 (Lecture & Discussion) or NR 232, CLL West (Lab)

Instructor: Dr. Kate Huyvaert
Office: Wagar 211C, Office hours: 10:00-11:30AM Mon (or by appointment)
Phone: 491-5520, Email: kate.huyvaert@colostate.edu

Teaching Assistant: Phillip Street
Office: Wagar 113 (office hours meet in Wagar 107),
Office hours: Tu,Th after class until 12:15 (or by appointment)
Email: phillipstrt@yahoo.com

Course Objectives: The purpose of this course is to introduce you to the principles of conducting sound scientific research in fish, wildlife, and conservation biology. Major concepts that we will cover include philosophy and history of science, application of the scientific method in fish, wildlife, and conservation biology research (from asking good questions to designing experiments to address those questions), and data collection & analysis. We will also address searching and reading the literature, scientific writing, and oral communication through preparation of ‘real-world’ research proposals. The course format will include lectures, group discussion of papers from the primary literature, and laboratory sessions designed to reinforce skills in statistics.

Course Reading & Additional Resources:

Discussion papers, lab documents, and other readings: Provided as PDFs on our RamCT page

Course Assignments:

Class discussions: Two class discussions will be held. Papers for these discussions will be taken from the primary literature emphasizing the philosophy of science, the scientific method, and the future of research in fish, wildlife and conservation biology. These papers will be posted on RamCT. Participation in discussion sessions is expected so it is critical that you read the papers, work through the discussion questions, and generally prepare to actively participate in discussion. Short quizzes (5-10min) before the discussion should be expected. Participation in the ‘How-to-Read-a-Scientific-Paper’ sessions is also expected.

Lab assignments & Homework: Three short ‘reports’ from the laboratory sessions will be due approximately one week after each lab session. We’ll also have several homework assignments to gain some practice in some key areas.

Research proposals: A formal research proposal (15-20 pages in length) describing a proposed project in fish & wildlife biology is required. You will work in groups of two to three to develop the proposal. The proposal will include a comprehensive literature review that motivates your topic, a statement of the ‘problem’ being examined (i.e., main hypothesis and predictions), justification/importance for your proposed research, detailed methods, expected results, and a detailed budget. Several ‘pieces’ of the proposal will be due as smaller assignments throughout the semester to help guide the process. You will also have the opportunity to give (and receive) anonymous peer feedback about the proposal process. Previous proposals and other helpful information will be posted on RamCT.

Proposal presentations: During the last two weeks of class, each group will give a 12 minute presentation describing and defending their proposed research followed by several minutes for the audience to ask questions. These presentations will be open to faculty and others in the department.
Student Evaluation & Grades:

Letter grades with +/- will be assigned with grade ranges-- A (90% or higher), B (80-89%), C (70-79%), D (60-69%), and F (<60%)-- and points distributed as follows:

- Participation, Discussions, Peer Feedback: 20%
- Midterm Exam: 15%
- Proposal ‘pieces’: 20%
- Final Research Proposal: 20%
- Oral Presentation: 10%
- Lab Assignments, Homework: 15%

Course Policies & Additional Information:

The course will adhere to CSU’s Academic Integrity Policy which is found at [http://www.catalog.colostate.edu/Content/files/2012/FrontPDF/1.6POLICIES.pdf](http://www.catalog.colostate.edu/Content/files/2012/FrontPDF/1.6POLICIES.pdf) and the Student Conduct Code [http://www.conflictresolution.colostate.edu/conduct-code](http://www.conflictresolution.colostate.edu/conduct-code). At a minimum, violations will result in a grading penalty in this course and will be referred to the Office of Conflict Resolution and Student Conduct Services.

For me, academic integrity is at the heart of a University and is central to my job as an objective scientist. Academic integrity is conceptualized in this course as doing and taking credit for one’s own work on written materials, exams, and other graded coursework. A number of excellent resources are available [http://learning.colostate.edu/integrity/index.cfm](http://learning.colostate.edu/integrity/index.cfm), [http://learning.colostate.edu/integrity/ways_to_avoid.cfm](http://learning.colostate.edu/integrity/ways_to_avoid.cfm) to help students better understand what constitutes plagiarism and why it’s so important to give credit where it’s due. We will also talk in class about how to properly cite outside sources.

Because our class is large relative to the classroom and lab spaces we are assigned, we’ll all need to be patient and considerate of each other, and those in adjoining classrooms, to get the most out of our class sessions. When possible, I’ve scheduled an additional room for the Discussions and have split the Lab sessions across two class periods so that everyone has sufficient space and help from instructors. Also, aspects of the syllabus and schedule may change as the course proceeds. Any change will be announced in class and schedule changes will be posted as an updated schedule on our RamCT Blackboard site and on lecture PDFs.
<table>
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<tr>
<th>Week</th>
<th>Day</th>
<th>Topic</th>
<th>Readings</th>
<th>Assignment (Due date)</th>
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| 1    | Tu  | 1/22  | Lec 1 - Course Objectives, Expectations, & Intro | McNeal reading guide; Ellwood et al. 2010  
| 1    | Th  | 1/24  | Lec 2 - History & Philosophy of Science; Ellwood "Vocab" | 1-minute Intros (1/24) |
| 2    | Tu  | 1/29  | Lec 3 - Scientific Method and Hypotheses; Ellwood "Results" | G&E 4 (pp. 79-90); Karban and Huntzinger Ch. 1&2  
| 2    | Th  | 1/31  | Lec 4 - Conducting Literature Searches; Proposal team mtgs. | Select proposal teams (1/31) |
| 3    | Th  | 2/7   | Lec 5 - Probability & Experimental Design | G&E 1 (pp.3-22), G&E 6 (G&E 7 for reference)  
| 4    | Tu  | 2/12  | Proposal meetings; Intro to Excel (on your own) | Intro to Excel HW (2/19, 4PM)  
| 5    | Tu  | 2/19  | Lec 6 - Sampling & Summary statistics | G&E 3  
| 5    | Th  | 2/21  | Lec 7 - t-tests, ANOVA | G&E 10 (pp.289-300; skim/reference rest)  
| 6    | Tu  | 2/26  | Lab 1 - Intro to Stats, t-test, ANOVA |  
| 6    | Th  | 2/28  | Lab 2 - Linear regression, 2-way ANOVA | Lab 1 report (3/7, 4PM)  
| 7    | Tu  | 3/5   | Lec 8 - Regression, 2-way ANOVA | G&E 9 (pp. 239-259), G&E 10 (pp. 304-8)  
| 7    | Th  | 3/7   | Lec 9 - Sample size and power | Review G&E pp. 100-103  
| 8    | Tu  | 3/12  | Lab 2 - Linear regression, 2-way ANOVA |  
| 8    | Th  | 3/14  | Lab 2 - Linear regression, 2-way ANOVA | Lab 2 report (3/26, 4PM)  
| 9    | Tu  | 3/19  | Proposal Approach Write-up |  
| 9    | Th  | 3/21  | Lab 1 report (3/7, 4PM) |  
| 10   | Tu  | 3/26  | Lab 3 - Stats Applications/Problem Sets | Lab 3 report (4/3, 4PM)  
| 10   | Th  | 3/28  | Lab 3 - Stats Applications/Problem Sets |  
| 11   | Tu  | 4/2   | Lec 10 - Scientific writing; Budgets | Day & Gastel Ch. 15, 30, 37  
| 11   | Th  | 4/4   | Midterm Review | Review ?s (4/3, 4PM)  
| 12   | Tu  | 4/9   | Midterm Exam | Abstracts (4/25, 4PM)  
| 12   | Th  | 4/11  | Lec 11 - Preparing/giving oral presentations | Web materials about giving talks  
| 13   | Tu  | 4/16  | Work on projects | Choose presentation times  
| 13   | Th  | 4/18  | Work on projects |  
| 14   | Tu  | 4/23  | Continue working on projects | Project consult (if needed)  
| 14   | Th  | 4/25  | Continue working on projects |  
| 15   | Tu  | 4/30  | Continue working on projects | Final proposals due (5/2, 4PM)  
| 15   | Th  | 5/2   | Oral presentations & defense of proposals |  
| 15   | Th  | 5/9   | Oral presentations & defense of proposals |  
|      |     |       |          |  

Proposal Approach Write-up

Lab 2 report (3/26, 4PM)

Lab 1 report (3/7, 4PM)

Lab 3 report (4/3, 4PM)