BIOL/WLF 602 (3 cr):
Research Design
CRN 73185 and 74211
Syllabus – Fall 2018

Instructor: Dr. Jeff Falke
Office Hours: Wednesdays 2-4 pm
210 Irving I Building
474-6044 (office)
jfalke4@alaska.edu

Time and Place: TR 11:30AM—1:00PM; Murie 105

Prerequisites: Graduate standing or permission of instructor.

Text: We will draw on a wide variety of sources of information during the class, including books, journal articles, and unpublished grant proposals and essays used with permission. Students will be supplied with copies of most of the readings in class and on the Blackboard website. I ask that you invest in at least two books that will prove useful throughout graduate school and beyond:


I also strongly recommend that you obtain a good style guide, such as:

Strunk, W. and E.B. White. The Elements of Style. (any edition)

Course description: The goal of this course is to provide students with tools and skills necessary to effectively plan a research project. Specifically, we will address science information literacy, grant proposal preparation, scientific methodology, experimental design, scientific ethics, and effective communication of science in writing and speech. Students are required to write a research proposal and to present preliminary and final versions of the proposed research in oral presentations. We will also cover general issues, both practical and philosophical, relevant to success in graduate school.

Course objectives: The goal of this course is for students to develop a broad understanding of physical processes that form and maintain freshwater habitats.

By the end of the semester, students enrolled in this class will be able to:

1. Develop appropriate research questions anchored in critical review of the literature
2. Differentiate between the internal vs external validity of a study
3. Differentiate between observational and experimental studies, and discuss the advantages and disadvantages of each
4. Describe good practices in sampling
5. Appreciate the practical importance of considering final data analysis plans to initial study design
6. Define experimental error and describe techniques to control its influence
7. Relate study design to inferential scope
8. Discuss opportunities for and dangers of bias in science
9. Recognize and discuss the importance of ethics in research
10. Better appreciate the challenges and practice of clear and compelling science writing
11. Write and present a logical and effective research proposal

**Instructional methods:** Course goals will be met through a combination of lectures, whole-class and small-group discussion, critical review of papers, written assignments, and critical and constructive review of each student’s work by peers and the instructor.

**Blackboard:** The course website will be administered through Blackboard. On Blackboard, you will find copies of readings and assignments and can check your grades. However, most information will be conveyed face-to-face class time.

Scheduling changes will appear in Blackboard. The schedule in this class is fluid and may change in response to student needs and interests. You will receive a paper schedule on the first day but it is very important to refer frequently to the schedule posted in Blackboard as the course proceeds.

**Course policies:** Students are expected to attend all lectures and discussions, turn in all assignments on time, and participate in all activities. Assignments are due in class. Late assignments will be marked down by 5% per day with a maximum penalty of 50%. Cheating, plagiarism, or other forms of academic dishonesty are unacceptable. Please adhere to the UAF Student Code of Conduct ([http://uaf.edu/catalog/catalog_13-14/academics/regs3.html](http://uaf.edu/catalog/catalog_13-14/academics/regs3.html)). Violations of the UAF Student Code of Conduct will result in immediate failure of the course.

**Grading:** The following is the overall grading basis for this course:

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<thead>
<tr>
<th>Percentage</th>
<th>Component</th>
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<tr>
<td>10%</td>
<td>Class participation</td>
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<tr>
<td>20%</td>
<td>Assignments</td>
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<tr>
<td>5%</td>
<td>Draft proposal oral presentation</td>
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<tr>
<td>10%</td>
<td>Peer reviews</td>
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<tr>
<td>5%</td>
<td>Proposal written draft 1</td>
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<tr>
<td>5%</td>
<td>Proposal written draft 2</td>
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<td>25%</td>
<td>Final written proposal</td>
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<td>10%</td>
<td>Final oral presentation</td>
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<td>10%</td>
<td>Final exam</td>
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<tr>
<td>100%</td>
<td>Total Grade</td>
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Be aware that all assignments, papers, and exams will be graded and recorded on a scale of 0 - 10. The relative weighting of graded items will occur in Blackboard.

Letter class grades will be assigned on the basis of the percentage of total points earned. Only whole letter grades will be given (no +/-).

The following letter grading system will be applied based on absolute scores:

- A = 90-100%
- B = 80-89
- C = 70-79
- D = 60-69
- F < 60

**Discussions:**

During some class periods we will discuss readings. A leader will be assigned to each reading during the previous class period. Leaders will be expected to introduce the reading to the class and then lead a class discussion of the main or important points. If a student does not attend class on the day he or she is assigned to lead a paper, another student will be chosen to lead on the spot. This is stressful for your fellow students, so please do your best to avoid the situation. Effective leadership of discussions and active participation in discussions lead by others is the major basis for assessing participation in the course.

When it is your turn to lead a discussion, here is what is expected of you:

- Read the paper carefully (twice if possible) and take notes. Clarify possible points of confusion, which may involve doing some background investigation and reading.
- As you read, think about how successfully the author met his or her goals and how useful the piece was for you. Was it clear, informative, effective? What were the most valuable or intriguing aspects of the piece? Do you agree with the author or take issue with some points? Thinking critically about the work will help you shape the class discussion. Note questions and points of interest that will stimulate discussion by the class.
- Introduce the paper to the class. State the overall goal or goals of the work and review the main thread of the argument. Do not reiterate the paper paragraph by paragraph to the class; everyone present should have read the paper.
- Lead a discussion of the paper. This might require you to pose questions to the class, or to make a contentions and solicit responses. It also might require you to redirect the conversation if it strays too far from the subject or becomes unproductive.
- Be aware that your job as leader is not to lecture, but to foster insight through discussion by the class as a whole.
• If it is not your turn to lead a discussion, you are expected to come to class well prepared to discuss all readings assigned for that day.

Assignments: There will be several written exercises intended to help you with aspects of project development. Assignments are due in class. If you miss class on a day an assignment is due, you must submit the assignment before class begins.

Research proposal: The major assignment in this class is to write a research proposal. Detailed instructions for the proposal required in class will appear in a separate handout. The exercise is intended to introduce you to all aspects of planning a research project and hone your grantsmanship. It is not necessarily intended to generate a research proposal suitable for your Biology & Wildlife Department graduate committee or comprehensive exam. Please be aware that your advisor and graduate committee may require different content and formatting for your actual graduate research proposal than that which is required in this class. Speak to your advisor about his or her expectations for your graduate research proposal.

Oral presentations: Students are expected to deliver two oral presentations in the class, using PowerPoint or a similar program to provide visual aids. The first is a brief (about 5 minute; details will follow) summary of your research question, background, and rationale. The second is a longer (15 – 20 minute) presentation of the full proposal. More detailed instruction and time limits will be given in class.

Working groups: Early in the course, students will be placed in small groups (3-4 people) based on research interests. Within these “working groups”, students will intensively review and discuss each other’s work throughout the class.

Peer review: Students will review draft versions of research proposals written by their working group members. Reviews will include a set of written comments and participation in a round-table discussion of each students work. A portion of your grade is based upon the quality of peer reviews you provide. Excellent peer reviewers are critical, thoughtful, and thorough; consider issues of logic, design, and feasibility as well as the quality of the writing; provide positive as well as negative feedback, and communicate tactfully, providing suggestions whenever possible.

Final exam: There will be a take-home final written exam that addresses some of the major learning objectives of the course.

Support services: The Writing Center (http://www.uaf.edu/english/writing-center/) offers tutorial and fax-tutorial assistance with grammar, composition, and style. Students connected to the UAF network (Ethernet or wireless on-campus or through VPN off-campus) have access to UAF Library catalogs, electronic journal holdings, and interlibrary loan resources. Miscellaneous support services (e.g., tutorial services, instruction in mathematics skills, academic advising, mentoring and personal support, cultural and social engagement, use of laptop computers, labs, and other technology resources, and direct financial assistance to qualified low-income participants) are available through UAF Student Support services (http://www.uaf.edu/sss/).
Disabilities services: The instructor will work with the UAF Office of Disability Services (208 WHITAKER BLDG, 907-474-5655) to provide reasonable accommodation to students with disabilities.

Title IX Protection: University of Alaska Board of Regents have clearly stated in BOR Policy that discrimination, harassment and violence will not be tolerated on any campus of the University of Alaska. If you believe you are experiencing discrimination or any form of harassment including sexual harassment/misconduct/assault, you are encouraged to report that behavior. If you report to a faculty member or any university employee, they must notify the UAF Title IX Coordinator about the basic facts of the incident.

Your choices for reporting include:

- You may access confidential counseling by contacting the UAF Health & Counseling Center at 474-7043;
- You may access support and file a Title IX report by contacting the UAF Title IX Coordinator at 474-6600;
- You may file a criminal complaint by contacting the University Police Department at 474-7721.