Course Outline

I remember receiving course outlines when I was a taking courses in undergrad. I also remember - very clearly - not reading course outlines that I received. Please take 10 min. to read through this outline. There is important information in here that will help you throughout the course.

Calendar Description

This course introduces the main concepts and principles of wildlife ecology. Topics covered include: population dynamics, animal behavior, habitats, genetics, predation, and habitat use. The lab component will introduce students to wildlife data collection, analysis, and interpretation.

Eligible Students

This course is intended for students working towards the BES in Environment and Resource Studies.

Course Goals

This course will provide an introduction to the main concepts and principles of wildlife ecology and management. Modern approaches to wildlife management and conservation often require the use sophisticated quantitative methods. This is not a statistics course; however, students will be introduced to the basic principles of quantitative ecology including study design, data collection and analysis, and simulation modeling. Understanding these basic quantitative principles will help students determine the reliability and quality of the information provided to managers and decision makers. Students will have the opportunity to explore data and model development through the lab component of the course. R is a powerful and flexible statistical software that we will use throughout the course to better understand the principles presented in lecture. Students will also collect field data on the local wildlife populations around the University of Waterloo and will develop models in lab to better understand the space use patterns of these species. Overall, it is my goal to provide you some tools to think clearly and critically about wildlife research and associated management decisions. I also want to provide you with working knowledge of R programming language and an introduction to the use and power of this tool. Computer programming is an important skill for modern ecologists. This course will provide an introduction.

Meetings

We will meet twice weekly on Mondays and Wednesdays. We will meet for the lecture portion of the course on Mondays from 2:30 pm to no later than 3:20 pm in RCH 209. We will meet for the computer lab portion of the course on Wednesdays from 2:30 pm to no later than 3:20 pm in the Galileo Lab EV1 240.

Field Trip

There is one off-site field trip planned for the course that will take place on on Friday November 19, 2016. The field trip is scheduled for the whole day. Specific pick up and drop off times will be provided closer to the date. We will travel to Wrigley's Corners Environmental Education

Centre. During the trip students will learn bird identification, point-count methodology, population estimation, and bird capture, marking, and handling techniques. For students that cannot attend the field trip an alternative assignment will be provided. There is no cost for the trip.

Instructor Contact

The course instructor is Dr. Brad Fedy, a faculty member in UW's Department of Environment and Resource Studies. Office number: EV2-2024; phone: 591-888-4567 ext. 32706; e-mail: bfedy@uwaterloo.ca. Fall 2016 office hours are Wednesdays from 1:00 pm to 2:00 pm. Office hours are opportunities for students to drop-in on a first-come-first-served basis. If you would like to meet and cannot make office hours, please send me an e-mail and we can find an alternative, mutually agreeable, time to meet. *Please expect, at least a 2 day turnaround for an e-mail response from me*. Sometimes it will be quicker, sometimes slower.

Electronic Delivery

The course has a dedicated web page that you can access through UW's LEARN system (`http://learn.uwaterloo.ca`). All course materials will be provided through the site. I will also use the LEARN site to post general messages to the class. I encourage you all to become familiar with the site as soon as possible and to check for updates on the site on a regular basis.

Required Readings

There is no text book required for this course. Their are a modest number of required readings that expand upon topics covered in lecture. They will be made available through the LEARN site. Most of your out-of-class time will be spent on the lab component of the course.

Lab Component

The course has a mandatory lab that meets on Wednesdays. Attendance at the lab is required. Each week, we will work through a set of exercises. A short assignment is associated with most lab sessions. The lab sessions during the first half of the semester will focus on introducing the students to R software and programming. The second half of the semester will be focused on the two assignments that are required for the course. The first assignment will focus on the analysis of the wildlife data the students will collect throughout the first half of the semester, the second will focus on matrix population modelling. Students are strongly encouraged to review the lab material in the lab manual prior to attending the lab session on Monday. All of the information required to complete the weekly lab assignments is contained within the lab manual.

Assignments

There are a suite of assignments associated with the lab component of this course. The first half of the course will focus on developing your proficiency with R software and programming. There are exercises due with most labs in the first half of the course. Labs are on Wednesday each week and there is an assignment associated with most weeks. These assignments are short, so do not let the number of them worry you. Additionally, all the materials required for the lab exercises

in the first half of the course are provided in the lab manual. You are encouraged to review this material prior to the lab sessions. There are two lab-related assignments that will be due in the second half of the course. These assignments will be more substantial and will require you to draw on the material presented in lecture. More details on the two assignments will be provided during the course; however, they are briefly outlined here.

- **UW Geese and Squirrel Distribution assignment** - We will collect location data on the local University of Waterloo populations of geese and squirrels. Students will be responsible for collecting these data during the first half of the course. We will organize the distribution of the data collection efforts during the first two weeks of the semester. During the second half we will use these data to develop distribution models to describe the patterns of wildlife habitat use surrounding the university. During our first lab session you will learn how to use maps and GPS units to record wildlife locations.

- **Matrix population modeling** - The UW geese and squirrel assignment will give you the opportunity to collect field data and analyze those data to assess habitat use. For the second major assignment we will use simulated data to understand how wildlife populations change and what features of animal life history have the greatest influence on fluctuations in population numbers. I will provide more details on this assignment as the course progresses.

Assessment

- Lab assignments (20%) - The lab assignments associated with first half of the course will be worth 20% of the final grade cumulatively. These are due as hard copies by the beginning of the next week lab.

- Midterm Exam (20%) - The midterm examination will be held in class on October 24, 2015.

- Field Trip (5%) - Several exercises will be conducted on-site and will need be submitted for marking. Field trip will take place on November 19, 2015.

- UW Wildlife Distribution assignment (15%) - Each student will prepare a paper on wildlife distribution modeling. The assignment must include clearly written answers to several questions regarding distribution modeling, examples of data screening, a spatially displayed representation of wildlife habitat use, and the R programming code required to generate the distribution model. More details will be provided throughout the course. Assignment is due in hard copy at the beginning of class on November 14, 2015. Data for the Wildlife Distribution assignment are due on October 31, 2016. Students that do not submit data will receive a 50% deduction on their assignment grade.

- Matrix Population Modeling Assignment (20%) - Each student will prepare a paper on matrix population modeling. The assignment must include clearly written answers to several questions regarding matrix population modeling, examples of data generation, a matrix population model, and the R programming code required to generate the model. More details will be provided throughout the course. Assignment is due in hard copy at the beginning of class on November 28, 2016.

- Final Exam (20%) - The final examination will be scheduled during the fall finals session.

Academic Integrity

A student is expected to know what constitutes academic integrity, to avoid committing academic offenses, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) should seek guidance from the course professor, academic advisor, or the Graduate Associate Dean. When misconduct has been found to have occurred, disciplinary penalties will be imposed under Policy 71 – Student Discipline. For information on categories of offences and types of penalties, students should refer to Policy 71 - Student Discipline (`http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm`). Students who are unsure what constitutes an academic offence are requested to visit the on-line tutorial (`http://www.lib.uwaterloo.ca/ait/`).

Within ENV, those committing academic offences (e.g., cheating, plagiarism) will be placed on disciplinary probation and will be subject to penalties which may include a grade of 0 on affected course elements, 0 on the course, suspension, and expulsion.

Students who believe that they have been wrongfully or unjustly penalized have the right to grieve; refer to Policy 70, Student Grievance (`http://www.adm.uwaterloo.ca/infosec/Policies/policy70.htm`).

ENV students are encouraged to review the material provided by the university's Academic Integrity office (`http://uwaterloo.ca/academicintegrity/Students/index.html`).

Miscellanea

Research ethics: Please note that the University of Waterloo requires all research conducted by its students, staff, and faculty which involves humans as participants to undergo prior ethics review and clearance through the Director, Office of Human Research and Animal Care (Office). The ethics review and clearance processes are intended to ensure that projects comply with the Office's Guidelines for Research with Human Participants (Guidelines) as well as those of provincial and federal agencies, and that the safety, rights and welfare of participants are adequately protected. The Guidelines inform researchers about ethical issues and procedures which are of concern when conducting research with humans (e.g. confidentiality, risks and benefits, informed consent process, etc.). If the development of your research proposal consists of research that involves humans as participants, then please contact the course instructor for guidance and see `http://iris.uwaterloo.ca/ethics`.

Note for students with disabilities: The Office for Persons with Disabilities (OPD), located in Needles Hall, Room 1132, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the OPD at the beginning of each academic term.

Religious observances: As applicable, each student needs to inform the instructor at the beginning of term if special accommodation needs to be made for religious observances that are not otherwise accounted for in the scheduling of classes and assignments.