

Course Outline

I remember receiving course outlines when I was 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 and the management of wildlife species. The course is divided into two main sections. The first half of the course will focus on the principles of wildlife ecology and the second half will explore the application of those principles to the management of wildlife species. Topics covered will include: population dynamics, animal behavior, habitats, genetics, predation, population models, and habitat use. The lab component will introduce students to the use of R statistical software as a tool to understand the application of models in wildlife management. Note: Successful completion of introductory statistics is recommended.

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. The course is generally divided into half. The first half of the course will provide foundations in the fundamental concepts in wildlife ecology. The second half of the course will address the application of those ecological concepts to the management of wildlife populations. 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 (and infamous) population of Canada Geese (*Branta canadensis*) around the University of Waterloo and will develop models in lab to better understand the space use patterns of this 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 Wednesdays and Fridays. We will meet for the lecture portion of the course on Wednesdays from 2:30 pm to no later than 4:20 pm in RCH 209. We will meet for the computer lab portion of the course on Fridays from 12:30 pm - 1:30 pm in EV2 1002A.

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. Winter 2014 office hours are Wednesdays from 12:00 pm to 1:00 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. Dr. Jeff Row, a postdoctoral fellow in UW's Department of Environment and Resource Studies, will be assisting with the computer lab portion of the course. Dr. Row does not have office hours, but will be available during most Friday lab sessions.

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 and all assignments will need to be submitted 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. There 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 Fridays. Attendance at the lab is required. Each week, we will work through a set of exercises. A short assignment will be due at the end of lab sessions for most weeks. 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 major assignments that are required for the course. The first assignment will focus on matrix population modeling, the second will focus on the analysis of the goose data the students will collect throughout the term (more details below). Students are strongly encouraged to review the lab material in the lab manual prior to attending the lab session on Friday. All of the information required to complete the weekly lab assignments is contained within the lab manual. Most lab assignments are due by the following Monday. Please consult the course schedule for details.

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 Friday and the assignments are due by the following Sunday night at midnight. These assignments are short, and in most cases, you will likely be able to complete the assignment during the allotted lab times on Friday. 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 on Friday. There are two assignments that will be due in the second half of the course (i.e., after reading week). 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.

- **Canada goose distribution modeling** - We will collect location data on the local University of Waterloo population of Canada Geese. 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 simple distribution models to describe the patterns of goose habitat use surrounding the university. During our first lab session (January 10, 2014) you will learn how to use maps and GPS units to record goose locations. We will organize the field data collection procedures during our first lab session.
- **Matrix population modeling** - The goose 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.
- Midterm Exam (20%) - The midterm examination will be held in class on February 12, 2014.
- Goose Assignment (15%) - Each student will prepare a paper on goose distribution modeling. The assignment must include clearly written answers to several questions regarding distribution modeling, examples of data screening, a spatially displayed representation of goose habitat use, and the R programming code required to generate the distribution model. More details will be provided throughout the course.
- Matrix Population Modeling Assignment (15%) - 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.

- Final Exam (20%) - The final examination will be scheduled during the spring finals session.
- Participation (10%) - Students are expected to participate constructively in all sessions.

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.