ERS 346 – Wildlife Ecology

Lecture: Tuesdays 14:30 - 15:50, DWE 1502

Lab: Thursdays 14:30 - 15:50, EV2-1002A

Lecturer:
Matt Dyson
Office location: EV2 2011
Office hours: Tuesdays 16:00 – 17:00
e-mail: mdyson@uwaterloo.ca

Lecturer Contact:
The course instructor is Matt Dyson, a PhD Candidate in UW's School of Environment, Resources and Sustainability. Office number: EV2-2011; e-mail: mdyson@uwaterloo.ca. Fall 2019 office hours are following lectures on Tuesdays from 16:00 to 17:00. 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.

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.

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 of 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 by researchers. 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 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 provide the basics for understanding the biology and ecology of a suite of taxa including birds, mammals, and herpetofauna. 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.

Lecture Schedule

Date	Topic	Required Readings	Supplementary Readings
Sep. 10	Wildlife: Mammology, Ornithology, and Herpetology	(Sells et al. 2018)	(Garton et al. 2012; pg. 1-12)
Sep. 17	Energy and Nutrition	Ch. 2	(Farley and Robbins 1995, Oppel et al. 2010, Washburn and Seamans 2012)
Sep. 24	Habitat, Movement, Dispersal, and Distributions	(Hall et al. 1997, Lele et al. 2013, Kirk et al. 2018)	Ch. 3, 4
Oct. 01	Population Dynamics	Ch. 5; (Cowardin and Johnson 1979)	(Reid et al. 2016)
Oct. 08	Competition, Predation, and Disease	Ch. 6, 7, 8; (Ripple et al. 2014)	(Williams et al. 2002, DeCesare et al. 2010, Reeder et al. 2012)
Oct. 15	Fall Break - no lecture	NA	NA
Oct. 22	Midterm – 20% (Weeks 1-5)		
Oct. 29	Wildlife Management and Policy	(Organ et al. 2012, Nichols et al. 2015)	(Anderson et al. 2017)
Nov. 05	Sampling and Counting	Ch. 12; (Garton et al. 2012; pg. 12-40)	
Nov. 12	Wildlife Techniques – Capture and Handling	(Schemnitz et al. 2012)	
Nov. 19	Harvest Management and Wildlife Control	Ch. 18, 19; (Nichols et al. 2007)	(Patterson et al. 2013, White et al. 2015, Kuzyk 2016, Bridger et al. 2017)
Nov. 26	Contemporary Approaches for Wildlife Ecology and Management	(Burton et al. 2015, Fuller et al. 2016, Hebblewhite 2017, Lamb et al. 2019)	
Dec. 03	Course Review and Evaluation		

Lab Schedule

Date	Topic	Lab Due Dates*
Sep. 5	Course Introduction and Overview; Module 1 - Beginning with R	
Sep. 12	Skulls Lab (Meet in Ecology Lab)	Skulls Assignment (in-lab)
Sep. 19	Module 2 - Operators and Functions	Module 1
Sep. 26	Module 3 - Getting Started with Data	Module 2
Oct. 3	Module 4 - Graphics	Module 3
Oct. 10	Module 4 - Graphics	
Oct. 17	Fall Break – no lab	NA
Oct. 24	Module 5 - Exploring Data with Graphics	Module 4
Oct. 31	Module 6 - Spatial Data	Module 5
Nov. 7	Module 6 - Spatial Data	
Nov. 14	Module 7 - Population Projection Models	Module 6
Nov. 21	Module 7 - Population Projection Models	
Nov. 28	Major Assignment Presentations	

**** Assignments are due before lab (14:29) on the date indicated above. Upload assignments to LEARN as .pdf documents.***

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. All assignments must be handed in through LEARN as .pdf documents.

Required Readings

There are required readings that expand upon topics covered in lecture. Required readings for the course are from Frxyell et al. 2014, which is electronically accessible from the library, or they will be provided through LEARN (e.g., journal articles, alternative textbook chapters). The majority of your out-of-class time will be spent on the lab component of the course.

Text on e-Reserve

I have arranged for electronic access to (Fryxell et al. 2014) through the University library (https://ebookcentral.proquest.com/lib/Waterloo/detail.action?docID=1701392). You should be able to access this from anywhere provided you login to your library account. There are limitations to what you can download, but you should always be able to access it to read while online. In addition, there should be a hard copy on reserve at the Porter library. Where appropriate, I have provided relevant chapter numbers associated with each lecture.

Fryxell, J. M., A. R. E. Sinclair, and G. Caughley. 2014. Wildlife ecology, conservation, and management. Third Edition. John Wiley & Sons, Ltd. West Sussex, United Kingdom.

Lab Component

The course has a mandatory lab that meets on Thursdays. Attendance at the lab is required. Each week, we will work through a set of exercises. A short assignment is associated with approximately half of the lab sessions. The lab sessions will focus on introducing you to R software and programming. Students are strongly encouraged to review the lab material in the lab manual prior to attending the lab session on Thursday. All of the information required to complete the weekly lab assignments is contained within the lab manual, which will be available on learn.

Assignments

There is a suite of assignments associated with the lab modules. These assignments are short, so do not let the number of them worry you. There are two larger assignments due throughout the course, one that involves keeping a field journal of outdoor observation of wildlife, and a group project that will rely on the basis of analysis that we develop throughout the course.

Assignments will be assigned a late penalty of **10% per day**. More details on the assignment will be provided during the course; however, they are briefly outlined here.

- ***Field Journal*** – A major component of understanding the ecology of anything is observation. Therefore, this assignment requires you to go outside throughout the semester and spend some time observing wildlife in their natural habitat and recording your observations in a field journal. I will introduce this assignment during the first lab and it is ongoing throughout the semester. You can find a pdf with more details of this assignment on LEARN.
- ***Population Modelling*** - For this group 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. The first part of this assignment will involve a mock funding proposal that you will develop individually related to a species of your choice and the second component will be done as a group and involve population modelling, a presentation of your findings and results to your peers, and a final report. I will provide more details on this assignment in Week 4.

Assessment

		Due date
Assignments		
Field Journal	10%	28 November before lab
Major Assignment	25%	See breakdown
Mock Funding Proposal	5%	04 November by 1700 h
Group Presentations	5%	28 November; In lab
Modelling Assignment and Report	15%	02 December by 1700 h
Lab assignments (7 total)	15%	Breakdown below
Skins and Skulls Lab Assignment	*2%*	12 September
Module 1	*1%*	19 September
Module 2	*1%*	26 September
Module 3	*2%*	03 October
Module 4	*2%*	24 October
Module 5	*2%*	31 October
Module 6	*5%*	14 November
Examinations		
Midterm Exam	20%	22 October; In Class
Final Exam (Cumulative)	30%	TBA; During final exam period

Academic integrity

In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. [Check the Office of Academic Integrity for more information.]

Grievance

A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70, Student Petitions and Grievances, Section 4. When in doubt, please be certain to contact the department's administrative assistant who will provide further assistance.

Discipline

A student is expected to know what constitutes academic integrity to avoid committing an academic offence, and to take responsibility for his/her actions. [Check the Office of Academic Integrity for more information.] 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) or about "rules" for group work/collaboration should seek guidance from the course instructor, academic advisor, or the undergraduate associate dean. For information on categories of offences and types of penalties, students should refer to Policy 71, Student Discipline. For typical penalties, check Guidelines for the Assessment of Penalties.

Appeals

A decision made or penalty imposed under Policy 70, Student Petitions and Grievances (other than a petition) or Policy 71, Student Discipline may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72, Student Appeals.

Note for students with disabilities

AccessAbility Services, located in Needles Hall, Room 1401, 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 AccessAbility Services at the beginning of each academic term.

Intellectual Property

Students should be aware that this course contains the intellectual property of their instructor, TA, and/or the University of Waterloo. Intellectual property includes items such as:

- Lecture content, spoken and written (and any audio/video recording thereof);
- Lecture handouts, presentations, and other materials prepared for the course (e.g., PowerPoint slides);
- Questions or solution sets from various types of assessments (e.g., assignments, quizzes, tests, final exams); and
- Work protected by copyright (e.g., any work authored by the instructor or TA or used by the instructor or TA with permission of the copyright owner).

Course materials and the intellectual property contained therein, are used to enhance a student's educational experience. However, sharing this intellectual property without the intellectual property owner's permission is a violation of intellectual property rights. For this reason, it is necessary to ask the instructor, TA and/or the University of Waterloo for permission before uploading and sharing the intellectual property of others online (e.g., to an online repository).

Permission from an instructor, TA or the University is also necessary before sharing the intellectual property of others from completed courses with students taking the same/similar courses in subsequent terms/years. In many cases, instructors might be happy to allow distribution of certain materials. However, doing so without expressed permission is considered a violation of intellectual property rights.

Please alert the instructor if you become aware of intellectual property belonging to others (past or present) circulating, either through the student body or online. The intellectual property rights owner deserves to know (and may have already given their consent).

Mental Health

The University of Waterloo, the Faculty of Environment and our Departments/Schools consider students' well-being to be extremely important. We recognize that throughout the term students may face health challenges - physical and / or emotional. **Please note that help is available**. Mental health is a serious issue for everyone and can affect your ability to do your best work.

Counselling Services http://www.uwaterloo.ca/counselling-services is an inclusive, non-judgmental, and confidential space for anyone to seek support. They offer confidential counselling for a variety of areas including anxiety, stress management, depression, grief, substance use, sexuality, relationship issues, and much more.

Religious Observances

Students need 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.

Unclaimed assignments

Unclaimed assignments will be retained until one month after term grades become official in quest. After that time, they will be destroyed in compliance with UW's confidential shredding procedures.

Communications with Instructor

All communication with students must be through either the student's University of Waterloo email account or via Learn. If a student emails the instructor or TA from a personal account they will be requested to resend the email using their personal University of Waterloo email account.

Recording lectures

- Use of recording devices during lectures is only allowed with explicit permission of the instructor of the course.
- If allowed, video recordings may only include images of the instructor and not fellow classmates.
- Posting of videos or links to the video to any website, including but not limited to social media sites such as: facebook, twitter, etc., is strictly prohibited.

Co-op interviews and class attendance

Co-op students are encouraged to try and choose interview time slots that result in the least amount of disruption to class schedules. When this is challenging, or not possible, a student may miss a portion of a class meeting for an interview. Instructors are asked for leniency in these situations; but, a co-op interview does not relieve the student of any requirements associated with that class meeting.

When a co-op interview conflicts with an in-class evaluation mechanism (e.g., test, quiz, presentation, critique), class attendance takes precedence and the onus is on the student to reschedule the interview. CECA provides an interview conflict procedure to manage these situations.

Students will be required to provide copies of their interview schedules (they may be printed from WaterlooWorks) should there be a need to verify class absence due to co-op interviews.