

Quantitative Analysis of Vertebrate Populations

Course Syllabus

Frostburg State University

Course Number: BIOL 514

Semester: Fall

Year: 2019

Instructor

Dr. Daniel Hocking, Compton 309, djhocking@frostburg.edu, 301-687-4343

Meeting Times and Locations

Lecture: MW 10:00 - 10:50 AM; CCIT 127B

Laboratory: F 8:00 - 10:50 AM; CCIT 127B

Office Hours: Monday 11:00 AM - 12:00 PM; Tuesday 9:00 - 10:30 AM, Wednesday 11:00 AM - 12:00 PM, Thursday 9:00 - 10:30 AM; or by appointment

Description

A survey of quantitative techniques used to describe, analyze and model vertebrate population phenomena and interactions among populations.

Prerequisites

MATH 120 or a course in calculus, MATH 109/209; BIOL 150, 160 or 161. BIOL 340 (General Ecology) recommended but not required.

Learning Objectives

- Gain understanding of population dynamics
- Learn how to model abundance and distribution of vertebrate populations
- Gain experience interpreting and analyzing existing population data
- Increase understanding of study design for collecting population data
- Gain experience with field methods for count data and mark-recapture
- Develop computational skills for fish and wildlife management
- Learn basic scientific programming skills in the R language
- Learn the basics of program MARK

Text

Powell, L. A., and G. A. Gale. 2015. Estimation of parameters for animal populations: A primer for the rest of us. Caught Napping Publications, Lincoln, Nebraska.

The textbook is available at the bookstore if you want a physical copy. There is also a free PDF version you can download at <https://larkinpowell.wixsite.com/larkinpowell/estimation-of-parameters-for-animal-pop>

Course Structure

The general structure of this course will consist of a weekly reading from the textbook with an associated question/notes homework assignment due before the start of class that day. This will usually be on Monday and you will only be able to turn in a maximum of two reading assignments late (up to three days) because these assignments are used to facilitate class discussion. Then typically on Wednesdays we will continue this discussion of the topics for the week and have an introduction to the software used to implement the methods. On Friday in lab there will be a weekly tutorial and an associated laboratory assignment. Lab assignments will usually be done in two parts (two Fridays in a row) and then be due the following (third) Friday.

Lab assignments may be turned in up to 3 days late with -10% penalty per day. No work will be accepted more than 3 days late. Saturday and Sundays are counted in these three days.

Grades:

Task	Points	Grade
Homework assignments	100	A > 90%
Laboratory assignments	600	B = 80 – 89%
Midterm Exam	100	C = 70 – 79%
Final Exam, comprehensive	200	D = 60 – 69%
Graduate Project	100	F < 60%
Total possible points	1100	

Total points and assignments may change to accommodate teaching and learning objectives. Grades are still based on percentage of total points. Grades from individual assignments will be posted on Canvas, **however, the grade calculated by Canvas may be incorrect because of differences in weighting of assignments.** It is your responsibility to calculate your current grade based on the grading scheme described above.

Laboratory

Please note that some of our labs may be conducted at local field sites. These labs will be conducted outside so you are expected to use common sense in deciding what to wear and what to bring. You will get dirty and you will get wet during these labs. Be prepared to spend 3 hours in areas without restrooms, if you have questions about outdoor restroom etiquette please consult leave-no-trace (lnt) principles: <http://www.lnt.org/training/educationaltraining.php>, <http://lnt.org/training/OnlineCourse/> or ask the instructor if you have specific questions. You must notify the instructor during the first week of class if you are allergic to bees or have never been stung by a bee.

Expectation of Student Work

Student work is defined as assignments, homework, and other academic activities to be completed outside of instructional time, including reading, studying, writing, research etc. Students should expect to spend a minimum of two hours per week completing this work for each credit hour enrolled (thus 6 hours of work outside of class for a 3-credit course), although the time spent outside of class may increase based on the topic and level of the course.

Course Topics and Schedule

The schedule will adjust based on the previous experience of students in the the class along with learning progress during the course. A rough outline of course topics follows:

Week	Chapters	Topics	Reading.HW	Lab	Lab.Due
1	1-2	Populations & probabilities		Intro R & prob	
2	3	Maximum Likelihood	HW 1	NO LAB	
3	5-6	Linear models (Jury Duty)	HW 2	Graphics & ML (rice)	
4	4	AIC	HW 3	Linear models & AIC	Lab 1
5	7-8	Closed Mark-Recapture		Intro MARK	
6	9	Known Fate	HW 4		Lab 2
7	10	CJS	HW 5	Midterm	
8	11	Recovery Data	HW 6	CJS in MARK	Midterm
9	12	Multi-state Models		CJS in R	
10	13	Robust Design	HW 7	Multi-state & Robust	Lab 3
11	14-15	Surveys & Occupancy	HW 8	Occupancy	Lab 4
12	16-17	Double-obs & Removal		Removal	
13	18	N-mixture	HW 9		Lab 5
14	19	Distance Sampling	HW 10		
15		Review		Work on Final Exam	Lab 6
16	Work on final				Final Exam

Important dates and information

- August 29: Last day to add or drop classes
- September 2: Labor Day - no classes
- November 1: last day to withdraw with a "W"
- November 27 - 30: no classes (Thanksgiving Break)
- December 9: last day of classes
- December 16: Final Exam 11:15 am - 1:45 pm
- Email and Canvas: Access to your email and Canvas is required for this class. Check your email daily.

Attendance

If you miss class, you miss whatever quizzes, exams, or activities that were administered and you will receive a zero. Attendance is critical to success. Makeup exams are extremely rare, and will likely be a different format from the original exam. However, you will be allowed to make up missed exams if you have a documented, excused absence. Additionally, if the absence was planned, you must notify me before the absence.

Documented excused absences are generally limited to the following examples: university sanctioned events (field trips, or events where the student is an athlete/performer), funerals (requires an obituary or other proof), or illness/medical emergencies (requires a doctor's note or other proof). For all of these, documentation must be provided. If a student is participating in extracurricular activities or has an excused absence, I must be notified within one week to arrange makeup assignments.

If you have an unexcused absence, you do not need to contact me. Common examples of unexcused absences are "family emergencies", "car trouble", and "my ride is leaving early this week." While you may deem these as legitimate excuses, accepting them as excusable absences and allowing students to make up work will only encourage widespread abuse. Makeups of any kind are not allowed for unexcused absences.

Class Policies

There will be no cell phones on the desk or in lab. You may not eat food or use tobacco products including electronic cigarettes in class or labs. Disruptive behavior (using phones, talking unrelated to the course, etc.) will not be tolerated. I will ask you to leave if I think you are being disruptive.

"The University will not tolerate disorderly or disruptive conduct which substantially threatens, harms, or interferes with university personnel or orderly university processes and functions. A faculty member may require a student to leave the classroom when his/her behavior disrupts the learning environment of the class. A student found responsible for disruptive behavior in the classroom may be administratively withdrawn from the course."

Beacon Early Warning System: all students should have a network of people who will support them in their educational journey. For that reason, the University uses a system known as Beacon, whereby your instructors and coaches, if applicable, can post notices about your academic behavior. For instance, if you are absent repeatedly from a class or are not completing assignments, your instructor may post a notice on Beacon. That information may be shared with your other instructors and/or your athletic coach. I will be monitoring notices posted on Beacon so that you and I may address any issues before they become obstacles to your academic success.

Confidentiality and Mandatory Reporting

Frostburg State University and its faculty are committed to maintaining a safe learning environment and supporting survivors of violence. To meet this commitment and comply with federal and state law, FSU requires all faculty and staff (other than the confidential employees in CAPS and Brady Health) to report any instances of gender-based harassment, sexual misconduct, relationship violence, or stalking against students. This means if you share your or another FSU student's experience with gender-based harassment, sexual misconduct, relationship violence, or, stalking, I have a duty to report the information to the University's Title IX Coordinator. The only exception to my reporting obligation is when such incidents are communicated during class discussion, as part of an assignment for a class, or as part of a University-approved research project.

Faculty and staff are also obligated to report allegations of child abuse and neglect to University Police and to Child Protective Services. This obligation extends to disclosures of past abuse even if the victim is now an adult and the abuser is deceased. My duty to report suspected child abuse and neglect extends to disclosures that are made as part of classroom discussions and in writing assignments.

If you or someone you know has experienced an incident of harassment or violence, please go to www.frostburg.edu/titleix to find information on reporting options and the resources and services available for support.

Frostburg State University Anti-Harassment and Retaliation Statement

Frostburg State University is firmly committed to maintaining a learning and workplace environment free from discrimination and harassment based on an individual's gender or sex. Sexual harassment, sexual assault, and other categories of sexual misconduct are forms of sex discrimination that are not tolerated and are expressly prohibited by FSU. Such misconduct undermines the University's mission and jeopardizes the character and integrity of our community. Retaliation against any individual who files a complaint of gender or sex discrimination or participates in the investigation of such complaint is strictly prohibited. Any member of the university community who believes they have experienced gender or sex discrimination, including sexual harassment and sexual violence is encouraged to promptly report the incident to FSU's Office of Gender Equity. The university is committed to conducting a prompt investigation and addressing any violation of university policies in a timely manner. Any finding by the university that a student or employee has engaged in an act or acts of sex discrimination (including sexual harassment and sexual violence) or retaliation will be promptly addressed and may result in disciplinary action, including termination of their university affiliation. It is the responsibility of all members of the FSU community to create a safe and inclusive environment. We must all work together to prevent any and all instances of gender and sex discrimination and sexual violence at Frostburg State University. Members of the university community may report allegations of gender or sex discrimination (including sexual harassment and sexual violence) to the Office of Gender Equity, 126 Hitchins, 301.687.3035, titleix@frostburg.edu. Individuals can also submit an online report at www.frostburg.edu/report. FSU offers a number of resources for individuals who have experienced gender or sex discrimination (including sexual harassment and sexual violence). Individuals wishing to obtain help and support can find a full list of resources, including confidential and off-campus resources, at www.frostburg.edu/titleix/getting-help-and-support/

Academic Honesty

Definition of Academic Dishonesty from your student handbook: "Academic dishonesty is defined to include any form of cheating and/or plagiarism. Cheating includes, but is not limited to, such acts as stealing or altering testing instruments; falsifying the identity of persons for any academic purpose; offering, giving or receiving unauthorized assistance on an examination, quiz or other written or oral material in a course; or falsifying information on any type of academic record. Plagiarism is the presentation of written or oral material in a manner which conceals the true source of documentary material; or the presentation of materials which uses hypotheses, conclusions, evidence, data or the like, in a way that the student appears to have done work which he/she did not, in fact, do. In cases involving academic dishonesty, a failing grade or a grade of zero (0) for either an assignment and/or a course may be administered. Students who are expelled or suspended for reasons of academic dishonesty are not admissible to other institutions within the University System of Maryland. Suspension or expulsion for academic dishonesty is noted on a student's academic transcript."

Any violation of academic honesty will result in a zero for that graded work, and a repeat violation will result in failure of the course. Cheating will be reported and further disciplinary action may be pursued by the University Judicial Board This includes plagiarism. I will check long answers, essays, and lab reports with plagiarism-checking software. When in doubt, just cite the source. There's nothing wrong with building on someone else's ideas, in fact it's the way progress is made in science. Just give that person credit. Even if you get some information from a website, don't cite what the website cited (unless you read that), just cite the website.

Persons with Disabilities

Frostburg State University is committed to providing equal educational opportunities for students with documented disabilities. Students who require disability services or reasonable accommodations must identify themselves as having a disability and provide current diagnostic documentation to Disability Support Services. All information is confidential. Please call x4483 or visit 150 Pullen Hall for more information.