COURSE SYLLABUS OUTLINE

Course Title and Number: Special Topics: Quantitative Ecology (BSC 680)
Semester and Year: Fall 2015
Lecture: Wednesday 2:00-3:50, room S-360

Instructor:
Name: Dr. Jayme L. Waldron
Office: S-378
Office Hours: Monday 9:30-11:00, or by appointment
Office Phone: 696-3361
Email: waldron3@marshall.edu

Office Hours: I make every effort to keep scheduled office hours. Please be aware that sometimes there are conflicts with required meetings, and I cannot be present. When possible, I will make announcements on muOnline if I am unable to make scheduled office hours. I strongly encourage you to make an appointment if you need to meet with me.

Course Description: Studies of free-ranging animal populations regularly involve collection of binary data (e.g., presence/absence, or "where?") and/or count data (e.g., how many?). The goal of this course is to introduce students how to design and implement field-based studies of wildlife populations. Specifically, students will learn how to use presence/absence, mark-recapture, and count data to estimate survival probability and occupancy. Furthermore, students will learn how to use count data to derive estimates of abundance. Upon completing this course, students will be able to develop hypotheses about wildlife populations and analyze data sets from field studies.

Credit: 2 hours in biological sciences
Prerequisites: Graduate Student

University Policies: By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy be going to www.marshall.edu/academic-affairs and clicking on "Marshall University Policies." Or, you can access the policies directly by going to http://www.marshall.edu/academic-affairs/?page_id=802

Academic Dishonesty/ Excused Absence Policy for Undergraduates/ Computing Services Acceptable Use/ Inclement Weather/ Dead Week/ Students with Disabilities/ Academic Forgiveness/ Academic Probation and Suspension/ Academic Rights and Responsibilities of Students/ Affirmative Action/ Sexual Harassment

Text Information:
Required Text:

1) Occupancy Estimation and Modeling (2006) by Mackenzie et al. (Eds.), Elsevier

*Additional Study Aids: Extra readings will be assigned.

***Computer Requirements:** Microsoft Word, Excel, SAS, and internet. Students will be required to download free software:

1. program Presence: http://www.mbr-pwrc.usgs.gov/software/presence.html

Desired Learner Outcomes/Objectives:

(1) Understand how to develop hypotheses about wildlife populations.
(2) Understand and interpret basic summary statistics.
(3) Learn how to design basic wildlife population studies.
(4) Acquire skills necessary to estimate survival occupancy probability.

Expected-learning-outcomes-rubric: how learning outcomes will be practiced and assessed.

Student Learning Outcomes	**How students will practice each outcome**	**How student achievement of each outcome will be assessed**
Understand how to develop hypotheses about wildlife populations	Reading assignments Homework Exams	1) Effective classroom discourse will depend on completion of reading assignments. Students must effectively relate reading assignments to lecture and classroom discussions. Students will be assessed based on their ability to use reading material in their homework assignments, and their knowledge of lecture and reading materials on exams. 2) I will evaluate homework using criteria outlined handouts.
Understand and interpret basic summary statistics	Reading assignments Lecture Homework	1) Students will be evaluated based on their performance (accuracy) on homework assignments and exams. Homework criteria will be outlined in handouts.
Learn how to design basic wildlife population studies	Homework Lecture Exams	1) I will evaluate the students' ability to complete homework assignments correctly and on time. 2) I will evaluate the accuracy of lecture exam questions. 3) Students will be assessed based on their willingness to participate (e.g., ask questions and answer questions) in discussions
Acquire skills necessary to estimate survival and occupancy probability.	Homework Lecture Exams	1) I will evaluate the students' ability to complete homework assignments correctly and on time. 2) I will evaluate the accuracy of lecture exam questions. 3) Students will be assessed based on their willingness to participate (e.g., ask questions and answer questions) in discussions

Grading Policy: Grading scale will be as follows:

90-100% = A 80-89% = B 70-79% = C 60-69% = D ≤ 59% = F

Exam 1	**25%**
Exam 2	**25%**
Final Exam	**25%**
Home Work	**25%**

Home Work

Homework assignments will be assigned during class and given a minimum of one week to complete. When assignments are not turned in on time, a letter grade will be deducted for every day the assignment is late.

Lecture Exams

There will be three take-home exams (including the final exam), and none will be cumulative. Exam dates on the syllabus may change, but exams will be announced at least one week in advance. Exams will include questions from lectures AND reading assignments. Students will be given one week to complete each exam. **All exams are expected to be taken as scheduled**. Make-up exams will not be given without an excuse from the university.

Participation: Attendance is MANDATORY. You will have to sign-in during every class period. Please consult the university policy on excessive absences (see link at beginning of syllabus). You can miss three classes (i.e., 10% of lectures). After the third absence, 3% will be deducted from your final grade for EVERY missed class.

Cell phones/texting: Mobile phones are not permitted in class. You will be dismissed from class if you are caught texting or if your phone rings. You will be given an absence for the day.

Laptops/ipads/notebooks/etc: I recommend that students bring computers to class; however, computers can ONLY be used when I indicate that it is appropriate (e.g., during modeling exercises). Notes must be taken using paper and writing utensils.

COURSE OUTLINE/DAILY/WEEKLY SCHEDULE:

Week (Dates)	Topic	Reading
Week 1 (Aug 26)	1) Course Introduction 2) Data & distributions 3) Measures of central tendencies and dispersion	
Week 2 (Sep 2)	1) Hypothesis development 2) One and two sample t-tests Note: "W" withdrawal period begins Sep 2	
Week 3 (Sep 9)	1) ANOVA 2) Introduction to study design	
Week 4 (Sep 16)	**EXAM 1 Hand out**	
Week 5 (Sep 23)	1) Introduction to General Linear Models 2) Linear regression **EXAM 1 Due**	
Week 6 (Sep 30)	1) ANCOVA 2) Introduction to Generalized Linear Models	Engqvist (2005)
Week 7 (Oct 7)	1) Logistic Regression 2) Poisson and Negative Binomial Regression (counts)	
Week 8 (Oct 14)	**EXAM 2 Hand out**	
Week 9 (Oct 21)	1) Introduction to Occupancy **EXAM 2 Due**	Chapters 1 & 2
Week 10 (Oct 28)	1) Principles of statistical inference 2) Program Presence	Chapter 3 Exercises 1-2 MacKenzie et al. (2002)
Week 10 (Nov 4)	1) Single-season, single-species occupancy models	Chapters 4 & 5 Exercise 3
Week 11 (Nov 11)	1) Application & Design	Chapter 6 Exercises 4-5, 9 Bailey et al. (2004)
Week 12 (Nov 18)	1) MARK introduction	
Week 13 (Nov 25)	Thanksgiving Break	
Week 14 (Dec 2)	**Final Hand out**	
FINAL EXAM	**Take home exam due Wednesday, Dec 9 at 4:00 PM**	