QUANTITATIVE WILDLIFE ECOLOGY

WIS 4601 - Fall 2012

Instructors:
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Office Hours: Wednesdays, 10:30-11:30 or by appointment

Lectures: Monday and Wednesday, (Period 3, 9:35-10:25 AM), WEIL 238

Labs: Friday, (Periods 3 & 4, 9:35-11:30 AM) MCCB 3086

Course Website: via UF Sakai https://lss.at.ufl.edu/

Course description:

Many ecological, management, and conservation needs for animal populations are related to assessing questions related to "how many, how much, where, and when". The goal of this course is to provide students with the motivation and training to assess these questions as commonly encountered by natural resource professionals. Upon completing this course, students will be able to formulate hypotheses related to individuals, populations or communities of animals, design studies to test these hypotheses, and analyze actual data sets from different field settings, and present scientific findings following the guidelines for scientific report writing.

Prerequisite:

STA 2023 and WIS 3401.

Required Text:

None, course packet will be available electronically via SAKAI that contains required weekly readings, lecture, and lab information.

GRADING

Grading will be based on:
20%, 33 points total, Quizzes based on readings (3 points each – best 11 out of 14)
20%, 150 points total, Weekly lab reports (15 points each – best 10 out of 11)
30%, 30 points total, Mid-term lab report
30%, 40 points total, Final comprehensive exam (Dec 13, 12:30 pm -2:30 pm)

A note on lab reports: You will choose which 10 lab reports to submit (of 11 lab assignments). If you submit more than 10 lab reports we will only record the first 10 lab reports you submit. You will not be able to replace a lab report grade with an additional lab report. The mid-term lab report must be submitted by each group and is not eligible to be skipped. It is highly recommended that you do not miss labs prior to the mid-term lab report as these labs will be helpful in completing you lab project. You should review the "Notes and guidelines for lab reports" document found on the course Sakai page.

Final course grades will be assigned based on the following percentages:

Percent of total points	Letter Grade
93-100%	A
90-92%	A-
87-89%	B+
83-86%	B
80-82%	B-
77-79%	C+
73-76%	C
70-72%	C-
67-69%	D+
63-66%	D
60-63%	D-
<60%	F

CLASS ATTENDANCE AND DEMEANOR POLICY

All students are expected to attend every class and lab and are responsible for the materials and information presented. Students who miss class for a UF approved reason (documented illness, trip, emergency, etc.) will be able to make-up exams and quizzes from that day. Unexcused late assignments will have 10% of the point total for that assignment deducted for each day late. A professional attitude is expected in all lectures and labs. Please do not disturb your fellow students by talking during class. Please minimize electronic distractions by silencing cell phones and eliminating electronic distractions during class and lab. While we will actively use computer resources in class and lab, it is strongly recommended that students focus on course material and minimize distractions from e-mail and social networking sites.

MAKE-UP EXAM POLICY

Make-up exams or assignment/homework problems will not be given for unexcused absences. An acceptable excuse (meeting guidelines from the UF handbook) must be submitted to be eligible for a make-up exam.

IMPORTANT GENERAL NOTICE TO STUDENTS

Academic Honesty:

As a result of completing the registration form at the University of Florida, every student has signed the following statement: "I understand that the University of Florida expects its students to be honest in all their academic work. I agree to this commitment to academic honesty and understand that my failure to comply with this commitment may result in disciplinary action up to and including expulsion from the University."

UF Counseling Services:

The University of Florida provides excellent resources on campus for students having personal problems or seeking additional career and academic assistance to help them realize their full potential. The University cares about you and your well-being. These resources include:

1. University Counseling Center, 301 Peabody Hall, 392-1575, personal and career counseling; http://www.counseling.ufl.edu/cwc/
2. Student Mental Health, Student Health Care Center, 392-1575, personal counseling;
3. Sexual Assault Recovery Services (SARS), Student Health Care Center, 392-1161, sexual counseling;
4. Career Resources Center, Reitz Union, 392-1601, career development assistance and counseling.

Software Use:

All faculty, staff and students of the University are required to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate.

General computer guidelines

For this course you will need to have access to Microsoft Excel. You will need to install the Solver function and the analysis tool-pack (both free). You will also need to install Program MARK (http://warnercnr.colostate.edu/~gwhite/mark/mark.htm) and program Presence (www.mbr-pwrc.usgs.gov/software/presence.html).

If you use a Mac, you will need to use BootCamp, Parallels, or VMware to run PC versions of MARK and Presence. Even though, there is a version Microsoft Excel for Mac, the Mac version does not include the analysis tool-pack. Therefore, you will also need a Microsoft version of Excel in your windows partition..

Version of Windows operating systems and Microsoft Office can be obtained very cheaply for students at the UF bookstore (~$15-20 each). We discuss this in the link below.

If you plan on using the computers in the computer lab where the course will be taught, you will need to know your Gatorlink Username and ID to log-in to the computers. It is also a good idea to bring a USB flash drive (aka jump drive) that you can save your files to and take them with you from the lab. These drives are widely available at electronics stores, UF bookstore, or online starting at about $5.

We have drafted simple guidelines for WEC undergraduates related to basic computing skills, computer software and hardware discounts available to you as a UF student, and a few thoughts on Mac vs. PC for use in this course. These guidelines can be found here:

http://www.wec.ufl.edu/undergrad/computer_policy.php

UF Guidelines
The official UF computing guidelines, which relate to all aspects of hardware, software, and network information at UF are available here

http://training.helpdesk.ufl.edu/computing.shtml

The following is the official UF policy on the student computer requirement:

Access to and on-going use of a computer is required for all students to complete their degree programs successfully. The University of Florida expects each student entering the junior year, as well as each student new to the university, to acquire computer hardware and software appropriate to his or her degree program. Competency in the basic use of a computer is a requirement for graduation. Class assignments may require use of a computer, academic

advising and registration can be done by computer, and official university correspondence is often sent via e-mail.

A note about the use and sharing of computer code

In this course you are expected to complete your own labs, including building your own spreadsheet or other computer program to help you complete the analyses and provide the information needed for writing the lab report. Writing your own program or spreadsheet is a key part of the lab assignment. Please do not attempt to re-use someone else's computer code. In several labs, you will be working with a unique data set such that, while it may appear to be similar to someone else's in the course, in reality it is different. When we grade the assignments, we would know that you did not use your code and data, and would also know whose code and data you used. Re-use of someone else's code and data would constitute a violation of the academic honesty policy for both parties and result in a zero on that assignment. Bottom line, do your own work.

A few key references

Via our Sakai page we will provide links to copies of book chapters, monographs, and peer reviewed literature. For review of basic statistical concepts we recommend

http://www.khanacademy.org/ and

http://onlinestatbook.com/ from Rice University, both are free and outs

The manual for Program MARK is a great reference with lots of examples and tutorials. Although you will NOT be responsible for reading this in its entirety, we strongly recommend that you read the whole thing at some point in your career. It is available for FREE online at:

http://www.phidot.org/software/mark/docs/book/

Quantitative Ecology

Day	Lecture	Topic	Methods and Models	Readings	Quiz
WEEK 1 **Wed, Aug 22**	Lecture 1 (MCCB 2102)	Part 1: Course Intro (Miguel, Brian and Bill) Part 2: Asking questions and developing hypotheses: Becoming an Ecological Detective. (Brian)	Go over syllabus and Sakai Make sure everyone can log in to Sakai Communicating via Sakai	Ellison and Dennis 2010	
Fri, Aug 24	Lab week 1	No Lab			
WEEK 2 **Mon, Aug 27**	Lecture 2 (MCCB 2102)	Part 1: Experimental design: basic principles and guidelines (Miguel)	Planning a study (asking good questions), the basics of sampling design.	Ecological Detective Chapter 1	
Wed, Aug 29	Lecture 3 (MCCB 2102)	Part 2: Experimental design (Miguel)	Sampling from a population	Krebs Ch 10	Quiz 1 Hilborn 1993
Fri, Aug 31	Lab week 2 (MCCB 3086)	Intro to Excel (Miguel)	**Assignment:** Excel orientation, formulas, plotting your data, naming variables, array/binning, filtering, pivot table, mean, median, mode	Gould, Kendall and Gould	
WEEK 3 **Mon, Sept 3**		**Holiday - no class**	**Holiday - LABOR DAY**		
Wed, Sept 5	Lecture 4 (MCCB 2)	Summary statistics (Brian)	Measures of central tendency, dispersion, frequency distributions		Quiz 2 Simberloff 1990

Fri, Sept 7	Lab week 3 (MCCB 3086)	Summary statistics and normal probability models (Brian & Miguel)	**ASSIGNMENT**: American Kestrel Lab		
WEEK 4 **Mon, Sept 10**	Lecture 5 (MCCB 2102)	Introduction to mathematical notation (Miguel)			
Wed, Sept 12	Lecture 6 (MCCB 2102)	Sampling and basics of probability distributions (Brian)	Normal, Poisson, negative binomial distributions – why does it matter?	Krebs Chpt 7 (7.1-7.2)	Quiz 3 Bolker 2008 Pages 120-126
Fri, Sept 14	Lab week 4 (MCCB 3086)	Fitting data to distributions and diagnosing model fits.(Brian & Miguel)	**ASSIGNMENT**: Fit data to distributions. "Going beyond normal…"		
WEEK 5 **Mon, Sept 17**	Lecture 7 (MCCB 2102)	Basic regression, comparing means (CI overlap, t-test, ANOVA) (Brian)		Quinn and Keough 5.3 Christensen et al. 1996	
Wed, Sept 19	Lecture 8 (MCCB 2102)	How many samples to take? Power analyses (Miguel)			Quiz 4 Steidl et al.
Fri, Sept 21	Lab week 5 (MCCB 3086)	T-test, Regression, and Power analyses (Brian & Miguel)	**ASSIGNMENT**: Power Lab- how likely are you to detect a change?	Krebs Ch. 7.4	
WEEK 6 **Mon, Sept 24**	Lecture 9 (MCCB 2102)	Taking a sample: Intro to quadrat and line transect sampling (Miguel)		Krebs Ch. 8,4,5	Quiz 5 Smith 1981
Wed, Sept 26	Lecture 10 (MCCB 2102)	Quadrat and line transect sampling (Miguel)		Krebs Ch. 4, 5	

Fri, Sept 28	Lab week 6 (MCCB 3086)	Introduce Midterm Project The Deepwater Horizon incident: Designing a rapid assessment of critical resources How to write a quality report Assign groups for project (Brian & Miguel)	**ASSIGNMENT**: What makes a good report? Dissect Paper		Quiz 6 Daleo et al. 2009
WEEK 7 **Mon, Oct 1**	Lecture 11 (MCCB 2102)	Detectability Part 1 Scaling from counts to abundance – from quadrats to whole area and CPUE to N (Brian)			Quiz 7 Eberhardt 1978
Wed, Oct 3	Lecture 12 (MCCB 2102)	Detectability Part 2 Line transects and aerial surveys (Brian)		Krebs Ch. 5, Caughley 1974	
Fri, Oct 5	Lab week 7 (MCCB 3086)	Lab help session(Work Day) – Analysis and Figures (Brian & Miguel)	Work on mid-term lab report		
WEEK 8 **Mon, Oct 8**	Lecture 13 (MCCB 2102)	Group Project Work Day (Miguel)			
Wed, Oct 10	Lecture 14 (MCCB 2102)	Detectability Part 3 Point counts and BBS case history (Miguel)			
Fri, Oct 12	Lab week 8 (MCCB 3086)	Group Edit 1st Draft	**Midterm Lab Report - 1st Draft Due, BRING TO CLASS**		
Final Lab Report Due Monday 15, before 9:35am					
WEEK 9 **Mon, Oct 15**	Lecture 15 (MCCB 2102)	Intro to mark-recapture methods and closed population models (Miguel)		Krebs Ch 2.	Quiz 8 Nichols 1992

Wed, Oct 17	Lecture 16 (MCCB 2102)	Closed population models for estimating abundance (Miguel)			
Fri, Oct 19	Lab week 9 (MCCB 3086)	Introduction to Lincoln-Peterson (Brian & Miguel)	**Assignment:** Mark-recapture simulation lab Lincoln-Petersen		
WEEK 10 **Mon, Oct 22**	Lecture 17 (MCCB 2102)	Capture and Open population models – JS (Brian)		Pollock et al. 1990	Quiz 9 White and Burnham 1999
Wed, Oct 24	Lecture 18 (MCCB 2102)	Capture and Open population models – JS (Brian)		Pollock et al. 1990	
Fri, Oct 26	Lab week 10 (MCCBG2103)	Abundance estimation (Brian & Miguel)	**Assignment:** Program MARK abundance estimation	White and Burnham 1999	
WEEK 11 **Mon, Oct 29**	Lecture 19 (MCCB 2102)	Known Fates Survival (Mayfield, KM) (Miguel)		Program MARK – A Gentle Introduction Chpt. 16 White and Burnham 1999	Quiz 10 Bennetts and Kitchens 1998
Wed, Oct 31	Lecture 20 (MCCB 2102)	CJS Survival (Brian)		Krebs Chpt. 14	
Fri, Nov 2	Lab week 11 (MCCB 3086)	Program MARK Snail Kite Lab	**ASSIGNMENT:** Estimating survival and detection of Florida Snail Kites, AIC model selection	White and Burnham 1999	
WEEK 12 **Mon, Nov 5**	Lecture 21 (MCCB 2102)	Robust design and case histories (Brian)			Quiz 11 Dreitz et al. 2002

Wed, Nov 7	Lecture 22 (MCCB 2102)	Multi-state Models (Brian)		Program MARK – A Gentle Introduction Chpt. 8	
Fri, Nov 9		**HOLIDAY – No Lab**	**HOLIDAY - Homecoming**		
WEEK 13 **Mon, Nov 12**		**HOLIDAY – No Class**	**HOLIDAY – Veteran's Day**		
Wed, Nov 14	Lecture 23 (MCCB 2102)	Introduction to Occupancy (Miguel)		Mackenzie's et al. chapter 4	Quiz 12 MacKenzie et al. 2002
Fri, Nov 16	Lab week 12 (MCCB 3086)	Occupancy modeling (Brian & Miguel)	**ASSIGNMENT** : Occupancy in program Presence		
WEEK 14 **Mon, Nov 19**	Lecture 24 (MCCB 2102)	Reporting rates (Brian)		Nichols et al. 1991	
Wed, Nov 21		**HOLIDAY – No Class**	**HOLIDAY – THANKSGIVING**		
Fri, Nov 23		**HOLIDAY – No Lab**	**HOLIDAY – THANKSGIVING**		
WEEK 15 **Mon, Nov 26**	Lecture 25 (MCCB 2102)	Diversity, species area curves (Miguel)		Krebs Ch. 12	Quiz 13 Warren et al. 2011
Wed, Nov 28	Lecture 26 (MCCB 2102)	Diversity, species area curves continued (Miguel)			
Fri, Nov 30	Lab week 13 (MCCB 3086)	Species diversity and species area curves (Brian & Miguel)	**ASSIGNMENT** : Calculation of species area curves, richness, diversity in spreadsheet		

WEEK 16 **Mon, Dec 3**	Lecture 27 (MCCB 2102)	Linking science and management: how do we use this abundance and survival info? Intro to adaptive management (Brian)			Quiz 14 Nichols and Williams 2006
Wed, Dec 5	Class Ends	Review			
Fri, Dec 7		**Reading Day – No Lab**	**Reading Day - Study**		