

**QUANTITATIVE WILDLIFE WIS 4601 - Fall 2014  
(Graduate section WIS 6934/Section 2E61)**

**Instructors:**

Bill Pine (billpine@ufl.edu)

Office Location: Building 87 Room 1 (near McCarty Hall and Reitz Union)

Office Hours: Wednesdays, 10:30-12:00 or by appointment

**TAs:**

Krystan Wilkinson (kawilkinson@ufl.edu)

Office Location & Hours: NZ 354 (Quant Lab) Wed 3-4 PM Thursday 12-1 PM

Brittany Bankovich (brittanybanko1@ufl.edu)

Office Location & Hours: NZ 354 (Quant Lab) Wed 10-12 AM, Thursday 10-11 AM

**Lectures:** Monday and Wednesday, (Period 3, 9:35-10:25 AM), MCCB G086

**Labs:** Friday, (Periods 2-3, 8:30-10:25 AM or Periods 4-5, 10:40 AM-12:35 PM)  
MCCB 3086

**Tutorials:** Lab help sessions, reserved lab time for WIS 4601, during TA office hours,  
Newins-Ziegler Quant Lab, Room 354

**Course Website:** via UF CANVAS <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 CANVAS that contains required weekly readings, lecture, and lab information.

## GRADING

### Grading will be based on:

36 points total, Quizzes based on readings and lecture material (12 quizzes, 3 points each)

200 points total, Weekly lab reports (20 points each - submit 10 out of 11)

30 points total, Group project 1

30 points total, Group project 2

30 points total Exam 1

30 points total Exam 2

30 points total Exam 3

A note on quizzes and lab reports: No make-up quizzes will be offered but there will be one or two bonus quizzes throughout the term. So if you miss a quiz make sure to take the bonus quiz. You will choose which 10 lab reports to submit (of 11 lab assignments). If you submit more than 10 lab reports I 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 person in each group (1 report per group) and is not eligible to be skipped. It is highly recommended that you do not miss any labs as lab information is used in completing group projects. I will meet with grad students enrolled in the course separately to discuss your projects as they will differ from the undergrad students.

### 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. Late assignments will not be accepted beyond 3 days post-due date. 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 and being a successful student requires mental and physical health. We want you to be successful. These resources include:

1. University Counseling Center, 301 Peabody Hall, 392-1575, personal and career counseling; <http://www.counseling.ufl.edu/cwc/> The Counseling Center also provides extensive help with anxiety stress management through a variety of innovative and free programs. Take advantage of these resources sooner rather than later! <http://www.counseling.ufl.edu/cwc/tao>
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; <http://www.crc.ufl.edu/>
  5. Students working with the Office of Disability Resources should provide their accommodation letters within the first 10 days of class. If you are unsure what resources Office of Disability Resources can provide then visit their web page to find out more. <http://www.dso.ufl.edu>. Accommodations include extended test taking time, alternate format exams, and other types of accommodations developed cooperatively with the Office of Disability Resources, the student, and faculty.

Unsure where to turn for help? Come see me. I want you to do well in this course and want to see you succeed as a student, a professional, and in life.

### 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

If you are using the IFAS or WEC computer labs you already have access to all of the software you will need. If you wish to use your personal computer, then you will need to install the same software we will be using for the course. Fortunately it is all free or inexpensive.

For this course you will need to have access to Microsoft Excel, R, and MARK. You will likely 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 possibly program Presence ([www.mbr-pwrc.usgs.gov/software/presence.html](http://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 (but this changes regularly so check with your version of Excel). Therefore, you may also need a Microsoft version of Excel in your windows partition. Or use the UF cloud version for free below.

There are also cloud based versions of Excel available to students here <http://info.apps.ufl.edu/>

We will use the free program R extensively. There are R builds for PC, Mac, Linux, etc. R can be downloaded here

<http://www.r-project.org/>

We will also use “R studio” another free program that makes R a little easier to use. It is available for Mac, PC, or Linux here

<http://www.rstudio.com/>

A version of the Windows operating systems and Microsoft Office can be obtained very cheaply for students at the UF bookstore (~\$15-20 each). I 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](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, writing your own R code, 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 references**

Via our CANVAS 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 are outstanding resources.

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/>

There are TONS of R resources on the web

<http://www.r-project.org/>

<http://irnr.tamu.edu/bret/BretWebSiteDocs/RCourseNotes.pdf>

check YouTube, check our CANVAS/Canvas page, check the library, look around....

# Quantitative Ecology - Schedule Draft August 22

Day	Lecture	Topic	Methods and Models	Readings	Quiz
<b>WEEK 1</b> Mon, Aug 25	Lecture 1 (MCCB G086)	Part 1: Course Intro  Part 2: Asking questions and developing hypotheses: Becoming an Ecological Detective.	Go over syllabus and CANVAS Make sure everyone can log in to CANVAS Communicating via CANVAS	Kendall and Gould 2002	
Wed, Aug 26	Lecture 2 (MCCB G086)	Part 1: Experimental design: basic principles and guidelines	Planning a study (asking good questions), the basics of sampling design.	Ecological Detective Chapter 1 Hilborn and Mangel	
Fri Aug 29	Lab week 1	Lab week 1: Intro to Excel	<b>Assignment week 1:</b> Excel orientation, formulas, plotting your data, naming variables, array/binning, filtering, pivot table, mean, median, mode		Quiz 1
<b>WEEK 2</b> Mon, Sept 1	Labor Day Holiday	Labor Day Holiday	Labor Day Holiday		
Wed, Sept 3	Lecture 3 (MCCB G086)	Part 2: Experimental design	Sampling from a population	Krebs Ch 1 and 10	
Fri, Sep 5	Lab week 2 (MCCB 3086)	Lab week 2: Intro to R	<b>Assignment week 2:</b> R orientation, formulas, plotting your data, naming variables, mean, median, mode		
<b>WEEK 3</b> Mon, Sept 8	Lecture 4 (MCCB 2)	Summary statistics	Measures of central tendency, dispersion, frequency distributions	Krebs Ch 8	Quiz 2

WIS4601C SYLLABUS - 2013 Syllabus Draft 8.25.2014

Wed, Sept 10	Lecture 5 (MCCB G086)	Sampling and basics of probability distributions Part 1			Quiz 3
Fri, Sept 12	Lab week 3 (MCCB 3086)	Lab week 3: Graphing in R	<b>ASSIGNMENT week 3:</b> Graphing in Program R		
<b>WEEK 4</b> Mon, Sept 15	Lecture 6 (MCCB G086)	Sampling and basics of probability distributions Part 2	Normal, Poisson, negative binomial distributions - why does it matter?	Krebs Ch 7 (7.1-7.2)	
Wed, Sept 17	Lecture 7 (MCCB G086)	CI, testing means, basic parametric stats Part 1		Quinn and Keough 5.3 Christensen et al. 1996	Quiz 4
Fri, Sept 19	Lab week 4 (MCCB 3086)	Lab week 4: Central tendencies and probability distributions in R	<b>ASSIGNMENT week 4:</b> R Central tendencies and fitting data to distributions		
<b>WEEK 5</b> Mon, Sept 22	Lecture 8 (MCCB G086)	CI, testing means, basic parametric stats Part 2			Quiz 5
Wed, Sept 24	Lecture 9 (MCCB G086)	CI, testing means, basic parametric stats Part 2 (regression)			
Fri, Sept 26	Lab week 5 (MCCB 3086)	Lab week 5: Basic parametric stats - t-tests, ANOVA, MCP	<b>ASSIGNMENT week 5:</b> Basic parametric stats - normality and variance checks, t-tests, ANOVA, MCP	Krebs Ch. 7.4	
<b>WEEK 6</b> Mon, Sept 29	Lecture 9 (MCCB G086)	Environmental impact studies  Power			



Wed, Oct 1	Lecture 10 (MCCB G086)	<u>Exam 1</u>	<u>Exam 1</u>	<u>Exam 1</u>	
Fri, Oct 3	Lab week 6 (MCCB 3086)	Lab week 6: Power analysis	<b>ASSIGNMENT week 6:</b> Power Lab - How likely are you to detect a change?	Krebs Ch. 7	Walters and Holling 1990
<b>WEEK 7</b> Mon, Oct 6	Lecture 11 (MCCB G086)	Quadrat and line transect sampling		Krebs Ch. 4, 5	Quiz 6
Wed, Oct 8	Lecture 12 (MCCB G086)	Line transect Introduce group project		Caughley 1974	
Fri, Oct 10	Lab week 7 (MCCB 3086)	Lab week 7: Using line transect to assess changes in oyster populations	<b>ASSIGNMENT week 7</b> Using line transect to assess changes in oyster populations		
<b>WEEK 8</b> Mon, Oct 13	Lecture 13 (MCCB G086)	Detectability part 1			Quiz 7 LeResche and Rausch 1974
Wed, Oct 15	Lecture 14 (MCCB G086)	Group project meetings	Appoint group chairperson		
Fri, Oct 17	Lab week 8 (MCCB 3086)	No Lab Homecoming holiday	<b>ASSIGNMENT week 8 No lab Homecoming</b>		
<b>WEEK 9</b> Mon, Oct 20	Lecture 15 (MCCB G086)	Detectability part 2			Quiz 8

WIS4601C SYLLABUS - 2013 Syllabus Draft 8.25.2014

Wed, Oct 22	Lecture 16 (MCCB G086)	Group project work day			
Fri, Oct 24	Lab week 9 (MCCB 3086)	<u>Group project 1 Due</u>	<u>Group Project 1 Due</u>	<u>Group project 1 Due</u>	
<b>WEEK 10</b> Mon, Oct 27	Lecture 17 (MCCB G086)	Why do we estimate abundance?		Pollock et al. 1990 Krebs Ch 2.	Quiz 9 Karanth et al. 2004
Wed, Oct 29	Lecture 18 (MCCB G086)	Lincoln-Petersen		Pollock et al. 1990 Lefebvre et al. 1982	
Fri, Oct 31	Lab week 10 (MCCBG2103)	Lab week 10: Lincoln-Petersen model and assessing assumptions and bias	<b>Assignment 8:</b> Lincoln-Petersen Lab	White and Burnham 1999	
<b>WEEK 11</b> Mon, Nov 3	Lecture 19 (MCCB G086)	Closed population models		Program MARK - A Gentle Introduction Chpt. 16 White and Burnham 1999	Quiz 10 Reichert et al. 2010
Wed, Nov 5	Lecture 20 (MCCB G086)	Open population models - CJS and Robust Design		Krebs Chpt. 14	
Fri, Nov 7	Lab week 11 (MCCB 3086)	Lab: Closed and open models	<b>ASSIGNMENT 9:</b> MARK closed and CJS models	White and Burnham 1999	
<b>WEEK 12</b> Mon, Nov 10	Lecture 21 (MCCB G086)	Survival estimation and Known fate models			Quiz 11 Martin et al. 2006

Wed, Nov 12	Lecture 22 (MCCB G086)	Case history and group project work day			
Fri, Nov 14		Group Project Work Day	Group Project Work Day		
<b>WEEK 13</b> Mon, Nov 17		Introduction to Occupancy <u>Group Project 2 DUE</u>	Introduction to Occupancy <u>Group Project 2 DUE</u>	Mackenzie's et al. chapter 4	
Wed, Nov 19	Lecture 23 (MCCB G086)	<u>Exam 2</u>	<u>Exam 2</u>	<u>Exam 2</u>	
Fri, Nov 21	Lab week 13 (MCCB 3086)	Occupancy modeling	<b>ASSIGNMENT 10:</b> Occupancy lab		
<b>WEEK 14</b> Mon, Nov 24	Lecture 24 (MCCB G086)	Reporting rates and citizen science		Nichols et al. 1991	Quiz 13
Wed, Nov 26	Lecture 25 (MCCB G086)	Holiday THANKSGIVING	Holiday THANKSGIVING		
Fri, Nov 28	Lab week 14 (MCCB 3086)	Holiday THANKSGIVING	Holiday THANKSGIVING		
<b>WEEK 15</b> Mon, Dec 1	Lecture 26 (MCCB G086)	Habitat and animal density relationships		Krebs Ch. 12	
Wed, Dec 3	Lecture 27 (MCCB G086)	Diversity, species area curves			
Fri, Dec 5	Lab week 15 (MCCB 3086)		<b>ASSIGNMENT 11:</b> Calculation of species area curves, richness, diversity		

<b>WEEK 16</b> Mon, Dec 8	Lecture 27 (MCCB G086)	Linking science and management: how do we use this abundance and survival info? Intro to adaptive management			Quiz 14 Shea 1998
Wed, Dec 10	<u>Exam 3</u>	<u>Exam 3</u>	<u>Exam 3</u>		