

**QUANTITATIVE WILDLIFE WIS 4601C - Fall 2020**

**Instructors:**

Bill Pine ([billpine@ufl.edu](mailto:billpine@ufl.edu))

Office Hours: Monday and Wednesday 10:30-11:30 AM or by appointment.

Connect to office hours via Zoom <https://ufl.zoom.us/my/bpine>

Jennifer Moore ([jennmoore924@ufl.edu](mailto:jennmoore924@ufl.edu))

Office Hours: Thursday 2:00-4:00 PM or by appointment

Connect to office hours via Zoom <https://ufl.zoom.us/my/jennmoore924>

**TA:**

Tyler Steven Coleman ([tyler.coleman@ufl.edu](mailto:tyler.coleman@ufl.edu))

Office Hours: Tuesday 4:00-5:00 PM

Connect to office hours via Zoom <https://ufl.zoom.us/my/tyler.coleman>

**Lectures:** Recorded lectures available through Canvas site ([elearning.ufl.edu](http://elearning.ufl.edu))

**Labs: Required weekly on Wednesday (9:35-10:25) or Friday (8:30-10:25) (pick one). Note the same lab instruction will be provided on Wednesday and Friday. The Wednesday session was originally scheduled as lecture. But because the lectures are recorded and available anytime, we are adding the Wednesday section as additional lab sessions to try and make the class a little smaller and facilitate our ability to help you individually and in small groups with lab concepts, linking lecture and lab, and trouble shooting coding problems.**

**Course Website:** via eLearning ([elearning.ufl.edu](http://elearning.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, 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 materials will be available electronically via eLearning.

**GRADING**

**Grading will be based on:**

100 points total, Weekly quizzes based on weekly lab, lectures, and readings (10 quizzes, 10 points each)

90 points total, Review quizzes based on big labs, lectures, and readings (3 evaluations, 30 points each)

70 points total, Attendance and participation (14 weeks, 5 points each week)

A note on quizzes and evaluations: No make-up quizzes will be offered. Quizzes are based on the weekly lab material, lectures and readings and are due one week after the lab is assigned. Big labs are cumulative but are weighted to include material from the previous 4 weeks (labs, lectures, and readings).

Attendance and participation will be determined by electronically recording attendance in weekly labs (either

Wednesday or Friday), meaningfully participating in online discussions through answering and asking questions, watching online lectures (observed by instructor via Canvas).

**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, Demeanor, RECORDING POLICY**

All students are expected to attend and participate in weekly lab and lectures 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 assignments 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.

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

### **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.

### **Required Software:**

For this course you will need to install both R and R Studio onto your computer. Both software programs are free to download and can be used on PC, Mac, Linux, etc. computers.

R can be download here: <http://www.r-project.org/>

R studio can be downloaded here: <http://www.rstudio.com/>

Note this may be updated to use RStudio Cloud and this will be determined near the beginning of the semester. [Rstudio.cloud](https://rstudio.cloud)

### **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 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 code is a key part of the lab assignment. Do not simply copy the code from the assignment, you must type the code into the screen yourself. We will also ask you to review written code and identify errors in the code. To be successful you must learn what the pieces of the code are actually doing. 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. We can also use a variety of electronic code comparison tools that check spacing, syntax, everything between documents. **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 and likely referral to academic affairs. 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/>, <http://onlinestatbook.com/> from Rice University, a great book and website is <https://moderndive.com/>, and <https://www.youtube.com/user/zedstatistics>. All of these resources are free and outstanding!

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/>

<https://r4ds.had.co.nz/>

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

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

## Course Outline

Week	Course Content
<b>Week 1 (Aug 31 – Sept 4)</b>	<b>Lecture 1:</b> Asking question and developing hypotheses <b>Lecture 2:</b> Becoming an “Ecological Detective” <b>Readings:</b> Ecological Detective Chapter 1 by Hilborn and Mangel <b>Lab 1:</b> Introduction to R <b>Assignment:</b> <i>Week 1 Quiz</i>
<b>Week 2 (Sept 7 – Sept 11)</b> MONDAY SEPT 7 – LABOR DAY	<b>Lecture 1:</b> Experimental design 1 <b>Lecture 2:</b> Experimental design 2 <b>Readings:</b> Hilborn 1993 <b>Lab 2:</b> Graphing to R, review the R “style” guide here for great tips on writing your code <a href="http://adv-r.had.co.nz/Style.html">http://adv-r.had.co.nz/Style.html</a> <b>Assignment:</b> <i>Week 2 Quiz</i>
<b>Week 3 (Sept 14 – Sept 18)</b>	<b>Lecture 1:</b> Summary statistics <b>Lecture 2:</b> Summary statistics <b>Readings:</b> Confidence interval primer <b>Lab 3:</b> Data Management in R <b>Assignment:</b> <i>Week 3 Quiz</i>
<b>Week 4 (Sept 21 – Sept 25)</b>	<b>Lecture 1:</b> Sampling and basics of probability distributions 1 <b>Lecture 2:</b> Sampling and basics of probability distributions 2 <b>Readings:</b> Bolker 2002 Chapter 4, Distributions hints, Wildlife Techniques Chapter 4 <b>Lab 4:</b> Distributions <b>Assignment:</b> <i>Week 4 Quiz</i>
<b>Week 5 (Sept 29 – Oct 2)</b> FRIDAY OCT 2 – HOMECOMING <i>Friday labs will meet on Monday (Sept 29) or Wednesday (Sept 31) this week.</i>	<b>Lecture 1:</b> Interpretation and integration of graphical and statistical results 1 <b>Lecture 2:</b> Interpretation and integration of graphical and statistical results 2 <b>Readings:</b> <b>Lab: Big Lab 1 - Review</b> <b>Assignment:</b> <i>Week 5 Quiz – Review</i>
<b>Week 6 (Oct 6 – Oct 9)</b>	<b>Lecture 1:</b> Basic parametric stats 1 <b>Lecture 2:</b> Basic parametric stats 2 <b>Readings:</b> <b>Lab 5:</b> Hypothesis Testing <b>Assignment:</b> <i>Week 6 Quiz</i>
<b>Week 7 (Oct 12 – Oct 16)</b>	<b>Lecture 1:</b> GLM <b>Lecture 2:</b> GLM <b>Readings:</b> <b>Lab 6:</b> Generalized Linear Models

	<b>Assignment:</b> <i>Week 7 Quiz</i>
<b>Week 8 (Oct 19 – Oct 23)</b>	<b>Lecture 1:</b> Detection probability 1 <b>Lecture 2:</b> Quadrat and line transect <b>Readings:</b> <b>Lab 7:</b> Line Transects (Distance Sampling) <b>Assignment:</b> <i>Week 8 Quiz</i>
<b>Week 9 (Oct 26 – Oct 30)</b>	<b>Lecture 1:</b> Detectability 2 <b>Lecture 2:</b> Why do we estimate abundance? <b>Readings:</b> <b>Lab: Big Lab 2 - Review</b> <b>Assignment:</b> <i>Week 9 Quiz – Review</i>
<b>Week 10 (Nov 2 – Nov 6)</b>	<b>Lecture 1:</b> Abundance estimation 1 <b>Lecture 2:</b> LP testing model assumptions <b>Readings:</b> Pine et al. 2003 <b>Lab 8:</b> Lincoln-Petersen <b>Assignment:</b> <i>Week 10 Quiz</i>
<b>Week 11 (Nov 9 – Nov 13)</b> WEDNESDAY, NOV 11 – VETERANS DAY <i>Wednesday lab will meet on Monday (Nov 9) this week.</i>	<b>Lecture 1:</b> Closed population modeling <b>Lecture 2:</b> Open population modeling <b>Readings:</b> <b>Lab 9:</b> Cormack-Jolly-Seber Models <b>Assignment:</b> <i>Week 11 Quiz</i>
<b>Week 12 (Nov 16 – Nov 20)</b>	<b>Lecture 1:</b> Survival estimation <b>Lecture 2:</b> Occupancy 1 <b>Readings:</b> <b>Lab 10:</b> Occupancy <b>Assignment:</b> <i>Week 12 Quiz</i>
<b>Week 13 (Nov 23 – Nov 27)</b> <b>THANKSGIVING</b>	<b>NO CLASS</b>
<b>Week 14 (Nov 30 – Dec 4)</b>	<b>Lecture 1:</b> Occupancy 2 <b>Lecture 2:</b> Adaptive management and wrap up <b>Readings:</b> <b>Lab: Big Lab 3 - Review</b> <b>Assignment:</b> <i>Week 14 Quiz -Review (due by December 17 at 2:30 pm)</i>
<b>Week 15 (Dec 7 – Dec 11)</b> <b>READING WEEK</b>	<b>NO CLASS</b>
<b>Week 16 (Dec 14 – Dec 18)</b> <b>EXAM WEEK</b>	<b>FINAL EXAM Dec 17 12:30 PM-2:30 PM</b>