

WIS4601C SYLLABUS – 2015 Syllabus Updated September 18, 2016

**QUANTITATIVE WILDLIFE WIS 4601 - Fall 2016**  
**(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, 10:30-11:30 or by appointment

**TAs:**

Krystan Wilkinson (kawilkinson@ufl.edu)

Office Location & Hours: 1:45-3:00 pm Friday (NZ 368)

Claudia Ganser (gancla@ufl.edu)

Office Location & Hours: 8-9:30 Thursday (NZ 368)

**Lectures:** Monday and Wednesday, (Period 3, 9:35-10:25 AM), NZH 0112

**Labs:** Friday, (Periods 2-3, 8:30-10:25 AM or Periods 4-5, 10:40 AM-12:35 PM)  
MCCB 3086 \*note attend the lab you signed up for

**Tutorials:** Lab help sessions, reserved lab time for WIS 4601, during TA office hours,

**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:**

## WIS4601C SYLLABUS - 2015 Syllabus Updated September 18, 2016

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

200 points total, Weekly lab reports - 20 points each, undergrads 10 reports; grad students 12 reports

30 points total, Group project 1

30 points total, Group project 2

25 points total Exam 1

25 points total Exam 2

25 points total Exam 3

\*Graduate students will have an additional assignment that will be discussed.

A note on quizzes and lab reports: No make-up quizzes will be offered. Quizzes are based on the readings, lecture material/topics, and discussions in lecture and lab. Quizzes will generally be due on Friday unless there is a holiday and they are shifted to later in the week. Quizzes may also be given in lecture on Monday or Wednesday. Exams are cumulative and may include material from lab discussions. The group projects must be submitted by each person in each group (1 report per group). It is highly recommended that you do not miss any labs as lab information is used in completing group projects. It is also recommended that you not "divide and conquer" a lab or group project by splitting the assignment questions between group members.

**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/quiz 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 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 (or similar spreadsheet), R, and MARK. You may 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>).

If you use a Mac, you will need to use BootCamp, Parallels, or VMware to run PC versions of MARK. I'm trying to figure out a work-around for Mac users. 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. But don't worry about this add-in too much.

There are also cloud based versions of Excel available to students here

<http://info.apps.ufl.edu/>

And there is an IFAS virtual computer lab that has everything you need. You can log in to this with any device and use R, Office, MARK, etc.

<http://cals.ufl.edu/lab/virtual-lab.php>

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/>

or

<https://www.rstudio.com/products/rstudio/download/>

Just download the free desktop version.

There are other text editors available also for free for R, just look around the web.

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 very 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. Do not simply copy the code from the assignment, 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. 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/> 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 15

Day	Lecture	Topic	Methods and Models	Readings	Quiz
<b>WEEK 1</b> Mon, Aug 22	Lecture 1 (NZH 0112)	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	Hilborn 1993	
Wed, Aug 24	Lecture 2 (NZH 0112)	Part 1: Experimental design: basic principles and guidelines	Planning a study (asking good questions), the basics of sampling design.	Ecological Detective Ch 1 Hilborn and Mangel; Hilborn 1993	
Fri Aug 26	Lab week 1	Lab week 1: Intro to R	<u>Assignment week 1: R orientation, formulas, plotting your data, naming variables, built in commands</u>		
<b>WEEK 2</b> Mon, Aug 29	Lecture 3 (NZH 0112)	Experimental design: Part 2	Sampling from a population	Krebs Ch 10 Johnson 2002	
Wed, Aug 31	Lecture 3 (NZH 0112)	Experimental design: Part 3			
Fri, Sep 2	Lab week 2 (MCCB 3086)	Lab week 2: Graphing in R	<u>Assignment week 2: Graphing in Program R Hurricane</u>		

<b>WEEK 3</b> Mon, Sept 5	Labor Day Holiday Lecture 4 no class	Labor Day Holiday	Labor Day Holiday	Labor Day Holiday	
Wed, Sept 7	Lecture 5 (NZH 0112)	Summary statistics	Measures of central tendency, dispersion, frequency distributions	Confidence Interval Primer	
Fri, Sept 9	Lab week 3 (MCCB 3086)	Lab week 3: Data management	<u>Assignment week 2: Graphing in Program R (rescheduled)</u>		
<b>WEEK 4</b> Mon, Sept 12	Lecture 6 (NZH 0112)	Sampling and basics of probability distributions: Part 1	Normal, Poisson, negative binomial distributions - why does it matter?	Bolker 2002 Chapter 4, Distributions Hints, Wildlife Techniques Chapter 4	
Wed, Sept 14	Lecture 7 (NZH 0112)	Sampling and basics of probability distributions: Part 2			
Fri, Sept 16	Lab week 4 (MCCB 3086)	Lab week 4: Central tendencies and probability distributions in R	<u>ASSIGNMENT week 3: Data management, entry, checking for outliers</u>		
<b>WEEK 5</b> Mon, Sept 19	Lecture 8 (NZH 0112)	<u>Exam 1 (tentative)</u>	<u>Exam 1 (tentative)</u>	<u>Exam 1 (tentative)</u>	
Wed, Sept 21	Lecture 9 (NZH 0112)	Sampling and basics of probability distributions: Part 2	Thinking about uncertainty		
Fri, Sept 23	Lab week 5 (MCCB 3086)	Lab week 5: Basic parametric stats - t-tests, ANOVA, MCP	<u>ASSIGNMENT week 4: R Central tendencies and fitting data to distributions</u>	Krebs Ch. 7.4	



<b>WEEK 6</b> Mon, Sept 26	Lecture 9 (NZH 0112)	CI, testing means, basic parametric stats Part 1	Estimating uncertainty and incorporating it into decision making		
Wed, Sept 28	Lecture 10 (NZH 0112)	CI, testing means, basic parametric stats Part 2 (regression)  Intro and assign group projects			
Fri, Sept 30	Lab week 6 (MCCB 3086)	Lab week 6: Review R skills and continue basic parameter stats. Work on group projects	<u>ASSIGNMENT week 5: Basic parametric stats - normality and variance checks, t-tests, ANOVA, MCP (due Oct 7)</u>  *Grad student lab section additional assignment on GLMs (optional for undergrads)	Krebs Ch. 7  Walters and Holling 1990	
<b>WEEK 7</b> Mon, Oct 3	Lecture 11 (NZH 0112)	Quadrat and line transect sampling		Krebs Ch. 4, 5	
Wed, Oct 5	Lecture 12 (NZH 0112)	Line transect	Detection = 1	Caughley 1974	
Fri, Oct 7	Lab week 7 (MCCB 3086)		<u>ASSIGNMENT week 8: Using line transect techniques to assess changes in oyster populations</u>  *Grad student section additional assignment on <u>DISTANCE methods</u>		

<b>WEEK 8</b> Mon, Oct 10	Lecture 13 (NZH 0112)	Lecture TBD			
Wed, Oct 12	Lecture 14 (NZH 0112)	Detectability part 1 Group project 1 due at 5:00		LeResche and Rausch 1974	
Fri, Oct 14	Lab week 8 (MCCB 3086)		<u>HOME COMING NO LAB</u>		
<b>WEEK 9</b> Mon, Oct 17	Lecture 15 (NZH 0112)	Detectability part 2			
Wed, Oct 19	Lecture 16 (NZH 0112)	Why do we estimate abundance?		Pollock et al. 1990 Krebs Ch 2.	
Fri, Oct 21	Lab week 9 (MCCB 3086)	Lab week 9: Simulating field data: Part 1 of Lincoln-Petersen lab	<u>Week 9: Simulating the sampling process to help plan a capture-recapture study (part 1 of Lincoln-Petersen lab)</u>		
<b>WEEK 10</b> Mon, Oct 24	Lecture 17 (NZH 0112)	<u>Exam 2</u>	<u>Exam 2</u>	<u>Exam 2</u>	
Wed, Oct 26	Lecture 18 (NZH 0112)	Lincoln-Petersen - using simulations to assess assumptions	Assign groups for project 2	Pollock et al. 1990 Lefebvre et al. 1982	
Fri, Oct 28		Lab week 10: Lincoln- Petersen model and assessing assumptions and bias	<u>Assignment week 10: Lincoln- Petersen lab, model performance when assumptions are violated (part 2 of 2)</u>	White and Burnham 1999	

<b>WEEK 11</b> Mon, Oct 31	Lecture 19 (NZH 0112)	Closed population models		Program MARK - A Gentle Introduction Chpt. 16 White and Burnham 1999	
Wed, Nov 2	Lecture 20 (NZH 0112)	Open population models - CJS and Robust Design		Krebs Chpt. 14	
Fri, Nov 4	Lab week 11 (MCCBG2103)	Lab: Closed and open models	<b>ASSIGNMENT week 11:</b> <b>MARK closed and CJS models</b>	White and Burnham 1999	
<b>WEEK 12</b> Mon, Nov 7	Lecture 21 (NZH 0112)	Finish Capture recapture		Nichols et al. 1991 Martin et al. 2006	
Wed, Nov 9	<b>Group project 2 assignment due</b>	<b>Group project 2 assignment due</b>	<b>Group project 2 assignment due</b>		
Fri, Nov 11	<b><u>Veterans Day HOLIDAY</u></b>	<b><u>Veterans Day HOLIDAY</u></b>	<b><u>Veterans Day HOLIDAY</u></b>	<b><u>Veterans Day HOLIDAY</u></b>	
<b>WEEK 13</b> Mon, Nov 14	Lecture 22 (NZH 0112)	Known fate, KM, reporting rates			
Wed, Nov 16	Lecture 23 (NZH 0112)	Introduction to Occupancy		Mackenzie's et al. chapter 4	
Fri, Nov 18	Lab week 13 (MCCB 3086)	Occupancy modeling	<b>ASSIGNMENT week 13:</b> <b>Occupancy lab</b>		
<b>WEEK 14</b> Mon, Nov 21	Lecture 24 (NZH 0112)	Habitat and animal density relationships			

WIS4601C SYLLABUS - 2015 Syllabus Updated September 18, 2016

Wed, Nov 23	Lecture 25 (NZH 0112)	Holiday THANKSGIVING	Holiday THANKSGIVING		
Fri, Nov 25	Lab week 14 (MCCB 3086)	Holiday THANKSGIVING	Holiday THANKSGIVING		
<b>WEEK 15</b> Mon, Nov 28	Lecture 26 (NZH 0112)	Habitat and animal density relationships		Krebs Ch. 12	
Wed, Nov 30	Lecture 27 (NZH 0112)	Linking science and management: Intro to Adaptive management pt 1			
Fri, Dec 2	Lab week 15 (MCCB 3086)		ASSIGNMENT week 15: Calculation of species area curves, richness, diversity		
<b>WEEK 16</b> Mon, Dec 5	Lecture 28 (NZH 0112)	Linking science and management: Intro to Adaptive management pt 2			
Wed, Dec 7	Lecture 29	Wrap up and review			
Thur, Dec 15	<u>Exam 3 completed online between 3:00-5:00 pm</u>	<u>Exam 3 completed online between 3:00-5:00 pm</u>	<u>Exam 3 completed online between 3:00-5:00 pm</u>	<u>Exam 3 completed online between 3:00-5:00 pm</u>	<u>Exam 3 completed online between 3:00-5:00 pm</u>