

**FNR3410C Natural Resource Sampling (3 Credits)**  
**Course Syllabus Fall 2023**

**INSTRUCTORS**

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**TEACHING ASSISTANTS**

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**OFFICE HOURS & COMMUNICATION**

For general course questions: The preferred method of communication is by Canvas email. An instructor or teaching assistant will respond within 48 hours. For technical issues and questions regarding the navigation and use of Canvas: Contact the UF Help Desk online at [helpdesk@ufl.edu](mailto:helpdesk@ufl.edu) or by phone (352) 392-HELP – select option 2. On occasion, we will send an email via Canvas regarding updates to the syllabus, clarifications of assignments, or changes in due dates. You should be checking your email on a regular basis.

**PREREQUISITES**

Statistics 2023

**PURPOSE OF THE COURSE**

Our ability to analyze and evaluate the environment around us requires effective data collection. Natural Resource Sampling examines the theory and techniques for sampling various characteristics of a variety of natural resources and attributes of the environments in which they are found. The course begins with a comprehensive review of elementary statistics and continues with specific applications of field sampling methods commonly used in forestry, fisheries, ecology, and wildlife management. In conjunction with learning various sampling methods, students will be exposed to a variety of analysis techniques and application of data obtained during laboratory sampling sessions. The techniques learned in this class will provide a foundation for more advanced labs in the other upper-division courses in the NRC major as well as provide supplemental instruction for those working in the natural resources field.

**OBJECTIVES**

By the end of the course, students should demonstrate an understanding of the following concepts and techniques:

- Statistical terminology and descriptive statistics
- Sampling theory and design
- Hypothesis testing; t-tests
- Forestry measurements, e.g. dbh, density, basal area
- Vegetation sampling methods - cover plots, line intercept and intersect methods
- Terrestrial and aquatic animal methods, e.g. double sampling, line transects, variable circular plots, point counts, recapture techniques, radio telemetry, fish sampling, depletion methods
- Environmental sampling, e.g. light, weather, basic soil and water

## **LEARNING OUTCOMES:**

Upon successful completion of the course, students should:

- Demonstrate an understanding of the underlying theories upon which sampling methods and frequently used statistics are based
- Develop hypothesis and demonstrate application of proper experimental design to sampling of animals, plants, and environmental variables
- Demonstrate correct sampling methodology and use of equipment to collect animal, plant, and environmental data
- Compute basic descriptive statistics for animal, plant, and environmental data
- Use computers and software programs to analyze data
- Perform t-test and simple regression when appropriate to analyze data
- Prepare graphs and tables using computer software to summarize descriptive data and statistical analysis
- Write scientific reports to interpret, present, and explain results of data collection

## **COURSE FORMAT & PARTICIPATION**

This is a 3-credit course, consisting of in-person class meetings, recorded lectures, and off-campus field labs. Dr. Donovan will cover the material related to basic statistics and sampling theory, forest vegetation sampling, and Human Dimensions (Modules/Weeks 1 – 7). Dr. Miller will cover the material related to wildlife, fish, and aquatic sampling (Modules/Weeks 8 – 16). Course materials (recorded lectures, assignments, quizzes, etc.) will be available through the Canvas e-learning site. <https://elearning.ufl.edu/>

Lecture recordings (where applicable) will be posted for each week in the respective Module in Canvas. Mandatory in-person class meetings will occur on Thursdays at 6:00 – 8:00 pm (Central) to discuss the lecture material and/or conduct outdoor mini labs. Mandatory field labs will occur off-campus on Saturdays throughout the semester (see Schedule below for dates) to reinforce and strengthen the concepts learned in class through hands-on activities.

The field labs will be conducted at several locations off-campus. Whenever field (outdoor) labs are scheduled, wear appropriate clothing (long pants and sturdy shoes) and bring water, sunscreen, and insect spray. Also, be prepared to take notes (clipboard, pen, and paper, or audio recorder) and pictures (if you have a camera). During the field lab students will practice techniques for properly handling equipment and collecting data. The data will be analyzed and presented in lab reports (see Description of Assignments below). Outdoor lab work is conducted as scheduled regardless of weather conditions. Never assume lab is canceled.

Students are expected to actively participate during the class meetings. When applicable, students must watch the recorded lectures and complete the weekly quiz (quizzes begin Week 8) on Wednesday at 11:59 pm (Central). Also, be prepared to answer questions, perform calculations, and work on in-class group activities.

## **TECHNOLOGY REQUIREMENTS**

- A computer or mobile device with high-speed internet connection.
- A webcam, headset and/or microphone, and speakers.
- Latest version of a web browser.

## TEXTBOOKS AND/OR READINGS

There is no required text for the course, but an introductory statistics textbook may be useful. The instructors highly recommend “CliffsNotes Statistics Quick Review, 2nd Edition” as an inexpensive resource. Also, there are numerous resources available online to assist you with mathematical and statistical calculations.

Additionally, you can access an e-book useful for this course for free from the UF library catalog: [Statistics for Terrified Biologists](#)

Other references (available on short-term loan from the instructors) include:

Silvy, N.J. 2012. *The Wildlife Techniques Manual*, 7<sup>th</sup> Ed. The Johns Hopkins University Press.  
Witlock, M.C., Schluter, D. 2009. *The Analysis of Biological Data*. Roberts and Company Publishers.  
Heyer, R., Donnelly, M. A., Foster, M., & Mcdiarmid, R. (Eds.). 2014. *Measuring and monitoring biological diversity: standard methods for amphibians*. Smithsonian Institution.

## OTHER COURSE RESOURCES

- LinkedIn Learning is a useful resource for help in Excel and other common software. It can be accessed by UF students for free at <https://training.it.ufl.edu/linkedin/>.
- For scientific literature, the “web of science” is available to students free of charge on campus or when connected by the campus VPN (virtual private network).  
[http://apps.webofknowledge.com/WOS\\_GeneralSearch\\_input.do?product=WOS&search\\_mode=GeneralSearch&SID=6FCzRdAxQtEBV9qHAPA&preferencesSaved=](http://apps.webofknowledge.com/WOS_GeneralSearch_input.do?product=WOS&search_mode=GeneralSearch&SID=6FCzRdAxQtEBV9qHAPA&preferencesSaved=)
- To set up the VPN on your computer, go to <https://it.ufl.edu/ict/documentation/network-infrastructure/vpn/anyconnect-installation--configuration-guide/>

## GRADES AND GRADING SCALE

Assignment	Point Value per Assignment	Total Points
Homework Assignments and Quizzes	10 pt. each	200
Mini Lab Reports	20 pt. each	20
Full Lab Reports	50 pt. each	100
Exams	100 pt. each	300
Participation	N/A	30
<b>Total</b>		<b>650</b>

Letter grades will be assigned as follows based on percent score:

A (93-100), A<sup>-</sup> (90-92), B<sup>+</sup> (86-89), B (83-85), B<sup>-</sup> (80-82), C<sup>+</sup> (76-79), C (73-75), C<sup>-</sup> (70-72), D<sup>+</sup> (66-69), D (63-65), D<sup>-</sup> (60-62), E (<60)

A complete explanation of the UF Grading policies can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

## **DESCRIPTION OF ASSIGNMENTS**

### ***Attendance***

Attendance/Participation in in-person classes and off-campus field labs are required. Useful participation requires asking thoughtful questions, responding to instructor's questions, and bringing in new perspectives.

### ***Homework Assignments***

Homework assignments will generally consist of a set of calculations to reinforce the statistical concepts discussed in class. All homework is due the following Wednesday at 11:59 pm (Central). To earn full credit, you must show your work (i.e., write out the equations). Some homework assignments will need to be completed in an Excel spreadsheet or in R statistical software. In those cases, you will be required to upload the Excel file or R code Text File to the assignment in Canvas to receive full credit.

### ***Weekly Quizzes***

There will be a short quiz (4-5 questions) each week there is a recorded lecture to reinforce lecture material not related to calculations. Weekly quizzes cover the coinciding/current Module lectures, and they are due on Wednesday before class meetings.

### ***Mini Lab Report***

The purpose of the mini lab is to practice using standard natural resource equipment and collect small data sets in an outdoor setting. In your mini report (total of 2-3 pages) you will briefly summarize the methods for data collection and analysis, present your results in tables and figures, and provide a brief (1-2 paragraph) interpretation of the results. You may also be required to upload to Canvas an Excel file (or attach additional sheets) showing your calculations.

### ***Full Lab Reports***

The purpose of extended Saturday labs is to gain experience with the techniques used in resource sampling and to reinforce the methods for analyzing environmental data. For full lab reports, you will present the results of the lab exercises using standard scientific reporting, including the following sections: Abstract, brief Introduction and Objectives, Methods, Results, and Conclusions. You will receive and should refer to the Report Writing Guidelines and the Grading Rubric sheet to review the specific criteria needed in each section. Your grade will be based on accuracy of calculations, clarity of text, grammar, and formatting/presentation.

### ***Exams***

Exams are intended to evaluate your understanding of conceptual material and to demonstrate your critical thinking and problem-solving skills in applying these concepts and techniques under a variety of sampling scenarios. The format will be a combination of calculations, matching, multiple choice, true/false questions, and short answer (3-4 sentences). The exams will be administered either in-person or online (TBD).

## **ATTENDANCE AND MAKE-UPWORK**

It is the responsibility of the student to access on-line lectures, readings, quizzes, and exams and to maintain satisfactory progress in the course. Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

Computer or other hardware failures, except failure of the UF e-Learning system, will not excuse students for missing assignments. Any late submissions due to technical issues MUST be accompanied by

the ticket number received from the Helpdesk when the problem was reported to them. The ticket number will document the time and date of the problem. You MUST e-mail your instructor within 24 hours of the technical difficulty if you wish to request consideration.

For computer, software compatibility, or access problems call the HELP DESK phone number—352-392- HELP = 352- 392-4357 (option 2).

### **LATE WORK POLICY**

Assignments and quizzes are turned in electronically via Canvas. Refer to the syllabus schedule or Canvas assignments tab for due dates and times. Without an excused absence, students will not have the option to complete a quiz after the established close date/time. Late assignments will lose value at the rate of 10% each subsequent late day (**weekend days count too!**).

### **COMMUNICATION COURTESY AND PROFESSIONALISM**

Just as in any professional environment, meaningful and constructive dialogue is expected in this class and requires a degree of mutual respect, willingness to listen, and tolerance of opposing points of view.

**Respect for individual differences and alternative viewpoints will be maintained in this class at all times.** All members of the class are expected to follow rules of common courtesy, decency, and civility in all interactions. Failure to do so will not be tolerated and may result in loss of participation points and/or referral to the Dean of Students' Office.

### **SEMESTER EVALUATION PROCESS**

Student assessment of instruction is an important part of efforts to improve teaching and learning.

**At approximately the mid-point of the semester**, the School of Forest, Fisheries, & Geomatics Sciences will request anonymous feedback on student satisfaction on various aspects of this course. These surveys will be sent out through Canvas and are not required but encouraged. This is not the UF Faculty Evaluation!

**At the end of the semester**, students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-result>.

### **ACADEMIC HONESTY POLICY:**

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: *"We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity."*

You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: *"On my honor, I have neither given nor received unauthorized aid in doing this assignment."*

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g., assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that

facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code.

Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see:

### **INCLUSIVE LEARNING ENVIRONMENT**

This course embraces the University of Florida's Non-Discrimination Policy, which reads,

*The University shall actively promote equal opportunity policies and practices conforming to laws against discrimination. The University is committed to non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information and veteran status as protected under the Vietnam Era Veterans' Readjustment Assistance Act.*

If you have questions or concerns about your rights and responsibilities for inclusive learning environment, please see the instructor or refer to the Office of Multicultural & Diversity Affairs website: <http://multicultural.ufl.edu>.

### **SERVICES FOR STUDENTS WITH DISABILITIES**

The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.

0001 Reid Hall, 352-392-8565, <https://disability.ufl.edu/>

### **SOFTWARE USE**

All faculty, staff and students of the University of Florida are required and expected 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.

### **CAMPUS HELPING RESOURCES**

For issues with technical difficulties for e-learning in Canvas, please post your question to the Technical Help Discussion in your course, or contact the UF Help Desk at:

- [Learning-support@ufl.edu](mailto:Learning-support@ufl.edu) | (352) 392-HELP - select option 2 | <http://elearning.ufl.edu>
- Library Help Desk support <http://cms.uflib.ufl.edu/ask>
- SFFGS Academic Hub <https://ufl.instructure.com/courses/303721>

### **STUDENT LIFE, WELLNESS, AND COUNSELING HELP**

UF CALS offers direct mental health counseling FREE OF CHARGE for students at distance locations (REC's) through an embedded counselor – Dr. Philip Daniels. He has a welcome video which can be

viewed here: [Dr. Daniels Welcome Video](#). If you are a student at a UF/IFAS Research and Education Center, you will be directed to Dr. Daniels for consultation and referral services. *Email communication has limited confidentiality and is reserved for scheduling, [pdaniels@ufl.edu](mailto:pdaniels@ufl.edu)* If you are in need of an appointment, please email or call Dr. Daniels directly (352) 392-1575.

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- Counseling and Wellness resources <http://www.counseling.ufl.edu/cwc/>
- U Matter, We Care <http://www.umatter.ufl.edu/>
- Career Connections Center <http://career.ufl.edu/>
- Other resources are available at <http://www.distance.ufl.edu/getting-help> for online students.

### **STUDENT COMPLAINTS:**

The School of Forest, Fisheries, & Geomatics Sciences cares about your experience and we will make every effort to address course concerns. We request that our online students complete a course satisfaction survey each semester, which is a time for you to voice your thoughts on how your course is being delivered. You can also [submit feedback anytime](#).

If you have a more urgent concern, your first point of contact should be the Academic Coordinator or the Graduate/Undergraduate Coordinator for the program offering the course. You may also submit a complaint directly to UF administration:

- <https://distance.ufl.edu/getting-help/>
- <https://registrar.ufl.edu/complaint.html>

**TENTATIVE SCHEDULE FALL  
2023**

In classroom, online sessions, and/or outdoors activities on the Milton Campus are held Thursday at 6 – 8 PM Central Time. Off-campus labs will be held on Saturdays (meeting location/time TBA). This course plan and syllabus are subject to change in response to student and instructor needs. Any changes will be clearly communicated in advance through Canvas.

<b>Date</b>	<b>Topics and Activities</b>	<b>Assignment Due</b>
<b>Week 1</b>	<b>Thursday, Aug. 24 at 6 PM</b> <i>In-person class meeting</i>  <i>Lecture:</i> Course introduction; summary statistics, using excel	
<b>Week 2</b>	<i>Recorded lecture:</i> Plotting	<b>Wednesday, August 30 at 11:59 PM</b> - Quiz #1 Due
	<b>Thursday, Aug. 31 at 6 PM</b> <i>In-person class meeting</i>	
<b>Week 3</b>	<i>Recorded lecture:</i> Sampling Design, Probability and Confidence Intervals	<b>Wednesday, Sept. 6 at 11:59 PM</b> - Quiz # 2 Due - Homework #1 Due
	<b>Thursday, Sept. 7 at 6 PM</b> <i>In-person class meeting</i>	
<b>Week 4</b>	<i>Recorded lecture:</i> Hypothesis testing part 1	<b>Wednesday, Sept. 13 at 11:59 PM</b> - Quiz #3 Due - Homework #2 Due
	<b>Thursday, Sept. 14 at 6 PM</b> <i>In-person class meeting</i>	
<b>Week 5</b>	<i>Recorded lecture:</i> Hypothesis Testing part 2	<b>Wednesday, Sept. 20 at 11:59 PM</b> - Quiz #4 Due - Homework #3 Due
	<b>Thursday, Sept. 21 at 6 PM</b> <i>In-person class meeting</i>  <i>Lecture:</i> Writing a lab report	
<b>Week 6</b>	<b>Thursday, Sept. 28 at 6 PM</b> <i>Exam 1</i>	
<b>Lab Fieldtrip</b>	<b>Saturday, Sept. 30</b> <i>Mini Lab: Aquatic Sampling</i>	
<b>Week 7</b>	<i>Recorded Lecture:</i> Human Dimensions	<b>Wednesday, Oct. 4 at 11:59 PM</b> - Quiz #5 Due - Homework #4 Due
	<b>Thursday, Oct. 5 at 6 PM</b> <i>In-person class meeting</i>	



<b>Week 8</b>	<i>Recorded lecture:</i> Intro to animal sampling; Indices & census; Fixed plots & aerial sampling	<b>Wednesday, Oct. 11 at 11:59 PM</b> - Quiz #6 Due - Homework #5 Due
	<b>Thursday, Oct. 12 at 6 PM</b> <i>In-person class meeting</i>	
<b>Lab Fieldtrip</b>	<b>Saturday Oct. 14</b> <i>Full Lab:</i> Wildlife Density (Bee) – Transect and Distance Sampling	
<b>Week 9</b>	<i>Recorded lecture:</i> Point counts and circle plots; Double sampling	<b>Wednesday, Oct. 18 at 11:59 PM</b> - Homework #6 Due - Quiz #7 Due
	<b>Thursday, Oct. 19 at 6 PM</b> <i>In-person class meeting</i>	
<b>Week 10</b>	<i>Recorded lecture:</i> Distance sampling - Unbounded line transect and variable circle plot; Monitoring populations using mark-recapture (resight)	<b>Wednesday, Oct. 25 at 11:59 PM</b> - Aquatic Mini Lab Report Due - Homework #7 Due - Quiz #8 Due
	<b>Thursday, Oct 26 at 6 PM</b> <i>In-person class meeting</i>	
<b>Lab Fieldtrip</b>	<b>Saturday Oct. 28</b> <i>Full Lab:</i> Forestry lab at Jay Research Facility	
<b>Week 11</b>	<b>Thursday, Nov. 2 at 6 PM</b> <i>Exam 2</i>	
<b>Week 12</b>	<i>Recorded lecture:</i> Occupancy	<b>Wednesday, Nov. 8 at 11:59 PM</b> - Homework #8 Due - Quiz #9 Due
	<b>Thursday, Nov. 9 at 6 PM</b> <i>In-person class meeting</i>	
<b>Week 13</b>	<i>Recorded lecture:</i> Radio telemetry and remote cameras	<b>Wednesday, Nov. 15 at 11:59 PM</b> - Wildlife Density Full Lab Report Due - Quiz #10 Due
	<b>Thursday, Nov. 16 at 6 PM</b> <i>In-person class meeting</i>	
<b>Week 14</b>	<b>Thanksgiving break</b>	
<b>Week 15</b>	<i>Recorded lecture:</i> Herpetofauna and small mammal sampling; Bird sampling	<b>Wednesday, Nov. 29 at 11:59 PM</b> - Forestry Full Lab Report Due - Homework #9 Due - Quiz #11 Due
	<b>Thursday, Nov. 30 at 6 PM</b> <i>In-person class meeting</i> <i>Review: Final Exam</i>	
<b>Week 16</b>	<b>Thursday, Dec. 7</b> <i>No class, reading days</i>	
<b>Week 17</b>	<b>Thursday, Dec. 14</b> <i>Final Exam</i>	