

**Natural Resource Sampling (FNR 3410C)**  
**Course Syllabus- Fall 2017**

**INSTRUCTORS**

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**OFFICE HOURS**

Dr. Sharma and Dr. Miller have an open door policy- if we are in, we can talk. Or, if you want to ensure that we will be available, contact us ahead of time (phone, email or see one of us after class) to set up an appointment. Dr. Sharma and Dr. Miller are also generally available by cell phone when not in the office.

**CREDIT HOURS**

This is a 3 credit "C" course, which means there is a lab associated with this course. Two credits of lecture equate to two hours of contact time per week, and one credit of lab equates to three hours of contact time per week. This totals to 75 hrs of contact time throughout the entire semester. We will have 2 hours of lectures per week, and lab hours will be distributed across Thursday class periods (mini-labs), full day Saturday field labs (double lab periods) and one over-night weekend field trip.

Additionally, for each hour of contact time in class, the student is expected to spend 2-3 hours out of class for assignments, study time, and class/lab preparation.

**MEETING TIMES**

Tuesday 5:00-8:00 pm, Room 4814  
3 mandatory Saturday field labs, 1 weekend field trip

**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, student will be exposed to a variety of analysis techniques and application of the 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 and simple regression
- Forestry measurements, e.g. dbh, hts, basal area; fixed area and variable radius sampling
- Vegetation sampling methods- cover plots, line intercept and intersect methods
- Terrestrial and aquatic animals 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

## FORMAT

This is a 3-credit course, consisting of instruction in both the classroom and the field. We will use the class meeting time for formal instruction including a combination of lecture, discussions, class activities, and computer labs. Dr. Sharma will be responsible for covering material related to basic statistics and sampling theory, forest vegetation sampling, and environmental data. Dr. Miller will cover material related to wildlife, fish and aquatic sampling. You are expected to actively participate during classes- expect to be called upon to answer questions, perform calculations, and work on group activities. The field labs will reinforce and strengthen concepts learned in class through hands-on activities. During the field lab you 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).

Much of the lab work done in FNR 3410 is conducted in the field, regardless of weather conditions. Whenever field (outdoor) labs are scheduled, you should wear appropriate field clothing (long pants and sturdy shoes), bring sunscreen, water and insect spray. You should also bring note taking supplies and a camera if you have one. If an outdoor lab is scheduled and inclement weather prevents completion of the lab it will be rescheduled. Never assume lab is canceled. Call the instructor when in doubt.

## REQUIRED MATERIALS

*You should bring a scientific calculator to each class, as well as a flash drive (or some other storage device) compatible with Campus computers.*

There is no required text for the course, but an introductory statistics text book 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. Other references (available on short-term loan from the instructors) include:

Avery, T.E., and H.E. Burkhart. 2015. *Forest Measurements*, 5th Ed. Waveland Press, Inc. Long Grove, IL. 456 p.

Triola, M.F. 2017. *Elementary Statistics*, 13<sup>th</sup> Ed. Pearson, New York. 792 p.

Bookhout, T.A. Editor. 1994. *Research and management techniques for wildlife and habitats*. Fifth ed. The Wildlife Society, Bethesda, Md. 740 p.

W. Ronald Heyer et al Editors. 1994. *Measuring and monitoring biological diversity standard measurements for amphibians*.

## ELECTRONIC COMMUNICATIONS

Course materials will be available through the Canvas e-learning site. You will find a link for handouts (syllabus, assignments, and supplemental readings) and for most powerpoint presentations. It is the responsibility of the student to print off powerpoint slides in advance of class. On occasion, we will send email to your UF email address regarding updates to the syllabus, clarifications of assignments, or changes in due dates. If you aren't doing so already, you should be checking your UF email on a regular basis.

## EVALUATION AND PERFORMANCE CRITERIA

<u>Assignment</u>	<u>% of final grade</u>
Homework Assignments	15
Mini lab reports	<b>10</b>
Full lab reports	<b>30</b>
3 exams	45
<b>Total</b>	<b>100</b>

Letter grades will be assigned as follows: 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>

**Excuses for late work and absences**—Assignments turned in on paper at the start of the class period or electronically by 5 pm (central) are considered on time. After that, late assignments will lose value at the rate of 10% each subsequent late day (**weekend days count too!**). Exams cannot be rescheduled, except in the cases of extended serious illness or family emergencies. Arrangements to make up missed exams or turn in late assignments must be made with the professor in advance of the due date. Saturday labs are mandatory and cannot be made up. A substitute assignment will be given when extenuating circumstances, approved by the instructors, result in absence from a Saturday lab.

## DESCRIPTION OF ASSIGNMENTS

### Homework Assignments

The homework assignments will generally consist of a set of calculations to reinforce the statistical concepts discussed in class. 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. In those cases, you will be required to upload the Excel file into Canvas to the instructor to receive full credit.

### Mini Lab Reports

During some class periods, you will practice using standard natural resource equipment and collect small data sets. In the mini lab reports you will summarize your efforts (methods) and results. These are intended to be slightly more in depth than the homework assignments, but less intense than the full-scale lab reports. In your mini reports 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 summary and/or interpretation of the results (total of 2-3 pages or so). You may also be required to upload the Excel file (or attach additional sheets) showing your calculations into Canvas.

## **Full Lab Reports**

The purpose of the extended Saturday lab is to gain experience with the techniques used in resource sampling and to reinforce the methods for analyzing environmental data. For the 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**

The exams are intended to evaluate your understanding of the 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 of the exam will be a combination of calculations, matching, multiple choice, true/false questions, and short answer (3-4 sentences).

## **CODE OF CONDUCT**

All students are expected to abide by the Student Honor Code (<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>). Students are expected to behave in a professional and courteous manner towards instructor and other classmates. This includes turning off AND putting away your cell phone during class.

In addition, plagiarism is taken very seriously at this institution, and can result in a reduced grade, failure of the course, and possible dismissal from the college. Plagiarism includes: 1) the direct use of any written material (**including internet sites!!**) without proper quotations and citation or 2) the submission of a document, in part or wholly authored by someone other than the student. It is up to the professor to evaluate the severity of any infraction and to determine the disciplinary action to be taken. The student should also be aware of his/her legal rights as defined in the Student Honor Code.

## **UNIVERSITY SERVICES**

You have full access to many student services available through the University of Florida, including:

[Disability Resource Center](#) : 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.

Career Resource Center, <http://www.crc.ufl.edu/>, Reitz Union, 352-392-1601, career development assistance and counseling.

## TENTATIVE SCHEDULE 2017

<b>Date</b>	<b>Topics and Activities</b>	<b>Assignment Due</b>
Week 1 Aug. 22	Outdoor Mini-lab: Intro to atmos and veg data/equipment Lecture: Review of statistics / Intro to sampling design	
Week 2 Aug 29	Lecture: Sampling theory and design Computer Lab: Getting to know Excel; atmos data	Homework #1 due today
Week 3 Sept. 5	Outdoor Mini-lab: GPS and navigation tools (no report req.) Lecture: Confidence intervals and hypothesis testing	HW #2 and Mini Lab (atmos data) <i>due today</i>
<b>Saturday Sept 9</b>	<b>Lab - Aquatic</b>	Mini Lab (aquatics) <b>due Oct. 31</b>
Week 4 Sept. 12	Outdoor mini-lab/ computer lab: canopy/light measurements Lecture: One sample t-tests	HW #3 due today
Week 5 Sept. 19	Outdoor mini-lab: canopy/light measurements part 2 Lecture: two sample t-tests	HW # 4 due today
Week 6 Sept. 26	Lecture: Sample size, shape and number Lab: TBD	HW # 5 due today Minilab (canopy) due
Week 7 Oct. 3	<b>Exam 1</b>	
<b>Saturday Oct 7</b>	<b>Lab- Wildlife Density – transect and distance (throughout Oct; schedule individually with Dr. Miller)</b>	<b>Full transects lab due Nov 21th</b>
Week8 Oct 10	Lecture: Human Dimensions- surveys, qualitative data; Other Ecological sampling techniques	
Week 9 Oct. 17	Outdoor mini-lab: forest equipment (dbh, BA,hts) Lecture/computer lab: Forest inventory calculations	
<b>Saturday Oct 21</b>	<b>Lab –Wildlife CAPTURE – RECAPTURE LAB and HERP Sampling</b>	Mini Lab (wildlife) <b>due Nov. 28</b>
Week 10 Oct. 24	Intro to Terrestrial and Aquatic Animal Sampling, Transects; Distance Sampling (ground cover calcs )	Homework #6 due today
<b>Oct 28-29</b>	<b>Solon Dixon weekend- forest inventory and groundcover sampling</b>	<b>Full forestry lab due Nov 14</b>
Week 11 Oct. 31	Animals: Aerial Surveys; Double sampling, Variable circular sampling;	Homework #7 due today; Aquatics Mini Lab due
Week 12 Nov. 7	<b>Exam 2</b>	
Week 13 Nov. 14	Capture- recapture and Schnabel DISTANCE PROGRAM for bee lab (transect lab);	Homework #8 due today, forestry lab due
Week 14 Nov. 21	Capture-recapture Bean exercise; Presence/ Absence methods; Radiotelemetry and preference calculation	Homework # 9 due today; Full lab Transect lab (bee lab) due
Week 15 Nov. 28	Presence/absence methods, “occupancy models”; Using wildlife cameras	Homework # 10 due today;

Week 16 Dec 5	Review for exam	Small mammal and Herps Mini Lab due
<b>Week 16</b> <b>Dec 12</b>	<i>Exam 3</i>	