

NRM 240 – Natural Resources Measurement and Inventory

Instructor – Nancy Fresco

Lectures - MW 1:00-2:00 O'Neill 201

Lab – Monday 2:15 – 5:15 O'Neill 359 and outdoors – come prepared to spend the lab period outside, regardless of weather!

Office Hours – by appointment – email me to set up a time to talk, get extra help, etc.

Email – nlfresco@alaska.edu (This is generally the best way to reach me.)

Reading:

There is no textbook for this class.

Reading material will include articles selected from published scientific literature and reports and websites produced by resource management agencies. These materials will be made available via Blackboard and web links. In some cases, you will be asked to search for literature online.

Course Description

How do natural resource managers know what's out there, and how it is changing over time?

Whether you are managing the timber in a forest, the salmon in a watershed, or the scenic vistas in a National Park, you need meaningful ways to measure the quantity, quality, and value of your resources.

This course is intended to familiarize students with terminology, tools, techniques, and statistical analysis used in measuring key components of natural resources. These components include land, timber, vegetation, water, wildlife resources, human dimensions, and agriculture/range resources. The course is designed to develop a basic understanding of how to design and set up a survey or inventory, conduct field measurements, and statistically analyze data. Critical thinking, field techniques, and data analysis will all be emphasized. This will lead to an improved understanding of resource management problem-solving and decision-making.

Field-based labs will introduce traditional and state-of-the-art equipment and methods used for inventory. Computer-based labs will give the students skills necessary to use inventory data in resource planning and problem solving.

Course Goals

Upon completion of this course students should be able to:

- 1) Understand and describe a range of inventory techniques for natural resource measurement;
- 2) Use critical thinking to select appropriate measurement and inventory techniques for different resource types under differing circumstances and in various landscapes;
- 3) Statistically analyze inventory results in order to derive sound estimates of resource properties;
- 4) Meaningfully critique inventory and measurements methods described in published articles or reports;
- 5) Develop an understanding of the human perceptions tied to natural resource management, and how to measure and account for these perceptions.

Instructional Methods

Presentation of material for this course will include lectures, instructor-led discussions, student-led discussions, and assignments. Students are expected to complete reading assignments prior to each lecture. Assigned homework is expected as scheduled on the course outline.

Course Policies

Attendance, Participation and Preparation: Students are responsible for all material distributed and presented in lectures and laboratory. Lecture attendance is important. Students are expected to come to class with assigned reading and other assignments completed. If necessary, excused absences must be arranged ahead of time. The student code of conduct can be found in the current UAF catalog and at the following website:
<http://www.uaf.edu/catalog/current/academics/regs3.html>.

Assignments: In addition to a mid-term and final exam, students will be responsible for thirteen lab write-ups and six assignments (generally problem sets or short-answer questions) over the course of the semester. Lab write-ups will be due at the next lab session, unless otherwise noted. Assignments will be handed out in class and also made available on Blackboard. The due date will be clearly marked on all assignments. Assigned reading will be posted to Blackboard.

All assignments are expected to be legible. Sentences should be grammatical and easy to read. The burden is always on the writer to communicate with the reader. Assignments may be emailed or turned in during class to the instructor. All assignments must be received by the due date unless otherwise arranged. Each assignment must include the student's name.

Grades: It is my intention to grade and respond to student assignments within seven days, and to post these grades in Blackboard as well as returning assignments in class.

Students should feel free to talk to me about comments or grades made on any assignment or exam. All student grades, transcripts and tuition information are available on line at <http://ww.uaonline.alaska.edu> and in the blackboard grades section.

A student may request an **Incomplete** grade if there are factors beyond his/her control that affect the completion of the course AND the student has a C grade or higher at the end of the semester/course. A Faculty-Initiated **Withdrawal** is done by the instructor when the student has not met the criteria for passing the class, and is within the University-allowed drop period. A **No Basis** (NB) grade is provided if the student has not met attendance/assignment criteria, in lieu of a failing grade, provided it is after the University-allowed drop period. All are at the discretion of the Instructor.

Academic integrity: **Academic integrity:** Plagiarism is using what another person has written, and using it as your own words and thoughts. Plagiarism is never acceptable. Neither is using AI to write assignments, or to write anything you claim as your own -- although AI is a fascinating tool that has its uses.

Collaboration and correct **referencing**, on the other hand, are not only acceptable, but are important aspects of scientific research and reporting. We'll be talking about all this in class.

Grading

The grade received in this course will be based upon performance on exams, homework, and lab assignments. Lab grades will be based on participation (50%) and quality of the write-up (50%). The following weighting scale will be used. Grades will not be curved, although extra credit may occasionally be available.

<u>Components of grade</u>		<u>Requirements for letter grade</u>	
<i>Midterm Exam</i>	20%	A+ > 96%	C+ 77% to 79%
<i>Final Exam</i>	25%	A 93% to 96%	C 70% to 76%
<i>Homework Assignments</i>	20%	A- 90% to 92%	
<i>Lab Assignments</i>	35%	B+ 87% to 89%	D 60% to 69%
		B 83% to 86%	
		B- 80% to 82%	
Total	100%		F < 60%

Homework and lab assignments handed in after the due dates are subject to reduced credit at a rate of 5 points per day or 20 points per week (whichever is less).

Disabilities Services

The University has many student support programs. The department will work with the Office of Disability Services to provide reasonable accommodation to assure equal access for all students.

Questions should be directed to the Director of Disability Services at (907)-474-5655.

<http://www.uaf.edu/disability/>

UAF Office of Disability Services

612 N. Chandalar, PO Box 755590

University of Alaska Fairbanks

Fairbanks, Alaska 99775-5590

Phone: (907) 474-5655 | TTY: (907) 474-1827 | Fax: (907) 474-5688

Student Support Services

UAF has a wide range of tutoring and mentoring services available to students (474-5314). This includes a writing lab. Remember, science requires coherent writing!

Lecture, Lab and Assignment Schedule

Not that this schedule is approximate. Always check Canvas to make sure of due dates, etc.

Date	Topic	Assignment given	Assignment due
Mon Aug 26	Introduction; measurement		
Monday Aug 26	FIRST DAY -- NO LAB		
Weds Aug 28	Accuracy, precision, bias, and estimation	#1: Estimation and critical thinking	
Mon Sep 2	LABOR DAY NO CLASS		
Mon Sep 2	LABOR DAY NO LAB		
Weds Sep 4	Sampling	#2: Conversions	#1: Estimation and critical thinking
Mon Sep 9	Statistics -- intro		
Mon Sep 9	Lab 1: Measuring individual trees	Lab 1	
Weds Sep 11	Standard error, hypotheses		#2: Conversions
Mon Sep 16	Confidence intervals, Type I and II error		
Mon Sep 16	Lab 2: Tree data collection	Lab 2	Lab 1 due
Wed Sep 18	T-tests	#3 Basic stats problems	
Mon Sep 23	Point sampling		
Mon Sep 23	Lab 3 More tree data	Lab 3	Lab 2 due
Wed Sep 25	Point sampling continued		#3 Basic stats problems
Mon Sep 30	Coordinate systems and mapping		
Mon Sep 30	Lab 4: Point sampling	Lab 4	Lab 3 due
Wed Oct 2	Maps continued		
Mon Oct 7	Land ownership and measurement	#4: Ecological Datasets	
Mon Oct 7	Lab 5: Map&compass	Lab 5	Lab 4 due
Wed Oct 9	MIDTERM EXAM		
Mon Oct 14	Stratified sampling		#4: Ecological Datasets
Mon Oct 14	Lab 6: Snow Sampling (weather dependent)	Lab 6	Lab 5 due

Wed Oct 16	Stratified sampling cont.		
Mon Oct 21	Power and sample size	#5 Wildlife Datasets	
Mon Oct 21	Lab 7: Intro to Spreadsheets	Lab 7	Lab 6 due
Wed Oct 23	Paired T tests		
Mon Oct 28	Population ecology and growth		
Mon Oct 28	Lab 8: Probability and CLT	Lab 8	Lab 7 due
Wed Oct 30	Pop. ecology cont.		#5 Wildlife Datasets
Mon Nov 4	Meta-populations and life tables	#6 Population Estimations	
Mon Nov 4	Lab 9: Hypothesis testing	Lab 9	Lab 8 due
Wed Nov 6	Estimating wildlife populations		
Mon Nov 11	Mark/recapture		
Mon Nov 11	Lab 10: Population dynamics	Lab 10	Lab 9 due
Wed Nov 13	Biodiversity		#6 Population Estimations
Mon Nov 18	Ecosystem valuation		
Mon Nov 18	Lab 11: Mark and Recapture	Lab 11	Lab 10 due
Wed Nov 20	Recreation opportunities		
Mon Nov 25	Rangeland resources and Water Resources		
Mon Nov 25	Lab 12: Real Data Wrangling #1	Lab 12	Lab 11 due
Wed Nov 27	NO CLASS THANKSGIVING		
Mon Dec 2	Lying with statistics		
Mon Dec 2	Lab 13: Real data wrangling #2 (no report)		Lab 12 due
Wed Dec 4	REVIEW FOR FINAL?		
Mon Dec 9	FINAL EXAM – normal UAF schedule -- 1-3 p.m.		