Forest Mensuration FOR 3430C

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Office Hours: Friday 11:30 – 12:30 am or email for appointments (Instructor C. Silva)
Office Hours: Wednesday 09:00 – 11:00 am or email for appointments (TA – Brock)

Lecture Schedule: Friday: Periods 4-5 (10:40 am – 12:35 pm) –
Lecture Location: 1745 McCarty Drive / 138 Newins-Ziegler Hall – Class Room 0219
Lab Schedule: Friday: Periods 7 - 9 (1:55 pm – 04:55 pm)
Lab Location: While the exact location may vary, in general, we will be meeting at the CALS Computer Lab (3108 McCarty Hall B**)** and at the Austin Cary Forest.
Class website: https://elearning.ufl.edu/

"What gets measured gets managed." (Pearl Zhu in her book "Digital Maturity" talking about e-commerce metrics but certainly applicable to forestry!)

Mensuration is a skill you will not likely master until you've been in the field for several years. A one semester course is basically the introduction. It's important to understand that the timber economy revolves around good or bad timber inventory.

Course Description

Forest mensuration is one of the most fundamental topics in forest science dealing with the quantification of trees, forests, and forest products. In this course you will learn about direct and indirect measurement of logs, whole trees, and forest stands as well as ways to statistically estimate various tree and stand characteristics. Future tree growth, stand yield, and mortality are predicted through models.

Course Essential Questions

- How is the volume of solid wood derived from tree measurements?
- How is solid wood volume related to various wood products produced?
- What aspects of tree growth and development can be used to estimate future forest stand characteristics?
- To what degree should mensuration be concerned with measurement problems in all aspects of multiple–use forestry?

Learning Objectives

Upon completing the course, students will be able to:

- properly measure physical characteristics of individual trees and forest stands so as to estimate solid wood product volumes;
- measure and analyze forest structure through sampling design, inventory, and basic statistical analysis;
- predict timber stand growth and yield through models;
- Apply problem-solving skills to issues involving timber stand management.

Cornerstone Tasks

- ***Laboratory Assignments:*** Written reports will describe lab activities and synthesis of collected field data plus reinforce R and Excel spreadsheet skills.
- ***Homework Assignments*:** Written assignments will reinforce lecture and lab content
- ***Quizzes:*** Online assessments of student knowledge through the course website (https://elearning.ufl.edu/)
- ***Lecture notes:*** One-page of lecture notes
- ***Forest Inventory Project (Final Project):*** Student crews will collaboratively plan, develop, and present a "real-world" inventory assignment to include inventory work and data summarization as a final project.

Teaching Methods

- ***Lectures:*** Narrated PowerPoint lectures will focus on presenting new information as well as that summarized from the assigned readings.
- ***Assigned Readings:*** Each week various articles and videos will be posted online prior to the lecture. It is to your advantage to read these articles as they will often reinforce information given in lectures, aid in field study, or contain information appearing on exams.
- ***Labs:*** Lab periods may happen in the classroom, on campus, or at a nearby location. Lab exercises are designed to provide students with hands-on experience with field methods, to reinforce lecture material, and to hear from experts during guest lecture periods. Typically, a written lab report will be prepared based on the subject matter and specialized instructions.
- **Homework:** Homework assignments are designed to allow the student to apply concepts from readings and lectures to real-world problems. Individual studies will often be required to complete these assignments as step-by-step instruction will not always be given in lectures.
- ***Quizzes:*** 13 quizzes will be given covering lecture material, assigned readings/videos, and lab subjects.
- ***Group Study:*** Students will often work in assigned groups (crews) to complete lab data collection, analysis, and certain reports. Students are encouraged to form small *ad hoc* study groups outside of class to reinforce concepts and informally quiz each other on the course material presented.
- ***Individual Study:*** Each student will be expected to attend class and labs in person; detailed note-taking is encouraged. In addition, students should complete assigned readings, produce required lab reports, and spend individual time reviewing materials in advance of quizzes.

Suggested Text

Forest Measurements, Fifth Edition. John A., Burkhart, Avery and Bullock, Waveland Press Inc. 2016 ISBN: 978-1-4786-3618-2. Online available free through UF library: https://ebookcentral.proquest.com/lib/ufl/detail.action?docID=4731589

Grading

Quizzes (13 @ 5 pts each):	65 pts
Lecture Notes (14 @ 5 pts each):	70 pts
Homework (best 7 of 8 @ 25 pts each)	175 pts
Lab Assignments (10 @ 18 pts each):	180 pts
Forest Inventory Project (written 130 pts + presentation 100 pts)	230 pts
Total:	720 pts

Quizzes: Timed quizzes will be given at intervals during the semester. Quizzes will be "open book". Quizzes will be completed on Canvas. You will be given 2 attempts to complete the quiz and your best attempt will be kept.

Lecture Notes: One-page lecture notes due at 8:30 am on Wednesday the next week at the beginning of class. Late homework will be assessed with a penalty of 50% before grading.

Homework: The best 7 scores out of 8 will count towards credit. Homework is assigned on a Wednesday and due at 08:30 am on Wednesday the next week at the beginning of class. Late homework will be assessed with a penalty of 50% before grading. Students may work together in groups, but each student must submit an assignment.

Group Project: Crews will collaboratively plan, develop, and present a 'real world' forest inventory report based on collected field data and data summarization.

Lab Assignments: Laboratory assignments will consist of: 1) a few questions related to the actual laboratory activities, 2) submission of data recorded in the field as a file and analysis. Assignments will be completed by your team but submitted individually.

Final grading follows University standards and is based on the following scale (https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx):

Letter Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E
Course Score	660 - 720	600 - <660	540 - <600	480 - <540	420 - <480	360 - <420	300 - <360	240 - <300	180- <240	120 - <180	60- <120	0-<60
Grade Points	4	3.67	3.33	3	2.67	2.33	2	1.67	1.33	1	0.67	0

General Course Prerequisites

This course is designed for FRC major undergraduate students who have completed courses in Natural Resource Sampling (FNR 3410C) or equivalent.

General Course Requirements, Attendance, and Make-Up Work

For a rewarding and safe experience in this class, it is necessary that you be self-motivated, independent, and that you always observe safety and proper planning. Be prepared for class means also having completed assigned readings.

Due to the nature of most labs in that data are collected for further workup or an experience is shared that requires analysis or comment, **attendance in the lecture and lab is mandatory, and lab reports may only be turned in if you attend the labs.** However, if there is a special circumstance covered by the UF attendance policy (https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/), please contact the instructor ahead of time.

It is your responsibility to keep track of assignment due dates and times as listed in Canvas. Some assignments may be due on paper at the beginning of a lecture period. Online assignment due times will be 11:59 pm or just before midnight. Assignments open and close based on the clock governing the Canvas server so submitting assignments at the last minute may prove troublesome for you – don't wait! A grace period, usually 12 hours, **may** be added to each assignment due date during which late work will be accepted (but deemed late). Any late assignment scores will be reduced by 50% of the original point value and then be graded according to the rubric. No assignments will be accepted after the assignment closes so do not email them to an instructor.

Generally, no make-up assignments will be offered other than for exceptional situations covered by the UF attendance policy (https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/), serious illness or injury (reported to the instructor and followed by a physician's note within five days of the first absence), or extreme weather resulting in the closure of campus. Extra credit assignments are rarely, if ever, provided.

Things you will need for this class:

1) A computer with R (https://www.r-project.org/), RStudio (https://www.rstudio.com/) and office software for written reports and internet access to the class eLearning site in Canvas. An alternative is accessing UF APPS http://apps.ufl.edu and using Microsoft Office software available there. Mac users are encouraged to use the version of Excel and other Microsoft Office software in UF APPS to ensure file compatibility.
2) Some way to take class and field notes (clipboard or hard binder for field notes).
3) For field labs, sunscreen, long sleeves, and a hat will help prevent sunburn.
4) A water bottle for field labs.
5) Some field activities may expose you to challenging environments that could include stinging insects, dense and thorny brush, heat, and wet terrain. Appropriate field gear, including heavy pants and boots, IS MANDATORY for this class in order to participate in field labs. **Individuals not properly dressed will not be allowed to participate. (University Insurance covers only properly outfitted individuals).** You may get muddy, wet, and sweaty depending on the lab site. Field labs happen rain or shine (nearby lightning or hail might send us scurrying to the vans).

If you are allergic to insect bites, or if you have other medical conditions for which emergency treatment may be required, **it is your responsibility to inform the instructor before the course starts, about:** (1) your specific condition, (2) where you keep your medicine, and (3) how to administer emergency treatment should the situation arise.

The following is important information concerning certain hazards of working outside in Florida:

- Chiggers: http://edis.ifas.ufl.edu/pdffiles/IG/IG08500.pdf or http://pherec.org/EntGuides/EntGuide6.pdf
- Ticks & Lyme Disease: http://edis.ifas.ufl.edu/pdffiles/MG/MG20400.pdf or http://fmel.ifas.ufl.edu/buzz/clticks.shtml

- Heat: http://solutionsforyourlife.ufl.edu/hot_topics/agriculture/heat_stress.html
- Dehydration: http://fineinstitute.com/patient-education/?id=11913&lang=English&db=hlt&ebscoType=static&widgetTitle=Spinal+Links

Class and Discussion Decorum

All course participants are expected to interact with dignity and professionalism in the classroom, in the field, or in an online discussion. Be professional. You are preparing for a career and should be learning to interact with your fellow classmates as you would in your future professional life. Written communication should follow standard rules for grammar and spelling and be clear, concise, and intelligent.

Be respectful and open to opinions and ideas that differ from yours. The exchange of diverse thoughts, ideas, and opinions is an important part of the scholarly environment. When responding to statements or posts made by others, address the ideas, not the person. Disagreement with the ideas of others is perfectly acceptable; ***how*** one disagrees should not be hurtful or offensive. Insulting remarks and name-calling are never appropriate.

Respect the formal learning environment. This includes arriving and leaving on time, shutting off cell phones and other electronic devices while in class, being open to the opinions and ideas of others, and working effectively and professionally in the field. Irresponsible and careless acts in the field will result in exclusion from future field activities. The first student to send the text "GoGators" to Dr. Silva (c.silva@ufl.edu) will receive a personalized Silvalab mug (expire on Jan 20/2025).

Academic Honesty

In 1995 the UF student body enacted a new honor code and voluntarily committed itself to the highest standards of honesty and integrity. When students enroll at the university, they commit themselves to the standard drafted and enacted by students. The quality of a University of Florida education is dependent upon community acceptance and enforcement of the honor code.

The Honor Code: **We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.**

On all work submitted for credit by students at the university, 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 all work will be completed independently unless the assignment is defined as a group project, in writing by the instructor. This policy will be vigorously upheld at all times in this course.

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: http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code.

Software Use

All faculty, staff and students of the university 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

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.

University Counseling & Wellness Center
3190 Radio Road, (352) 392-1575, www.counseling.ufl.edu/cwc/
Counseling Services
Groups and Workshops
Outreach and Consultation
Self-Help Library
Training Programs
Community Provider Database

Office of Victim Services
1515 Museum Road, (352) 392-5648, https://police.ufl.edu/about/divisions/office-of-victim-services/

Career Resource Center
First Floor JWRU, (352) 392-1601, www.crc.ufl.edu/

Students with Disabilities
0001 Reid Hall, (352) 392-8565, www.dso.ufl.edu/drc/

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. **If you have registered with the Disability Resource Center and require academic accommodations, it is your responsibility to privately inform the instructor of your needs as soon as possible before the first class session.**

UF attendance policy
https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/
Please contact the instructor ahead of time or as soon after an absence to be considered excused.

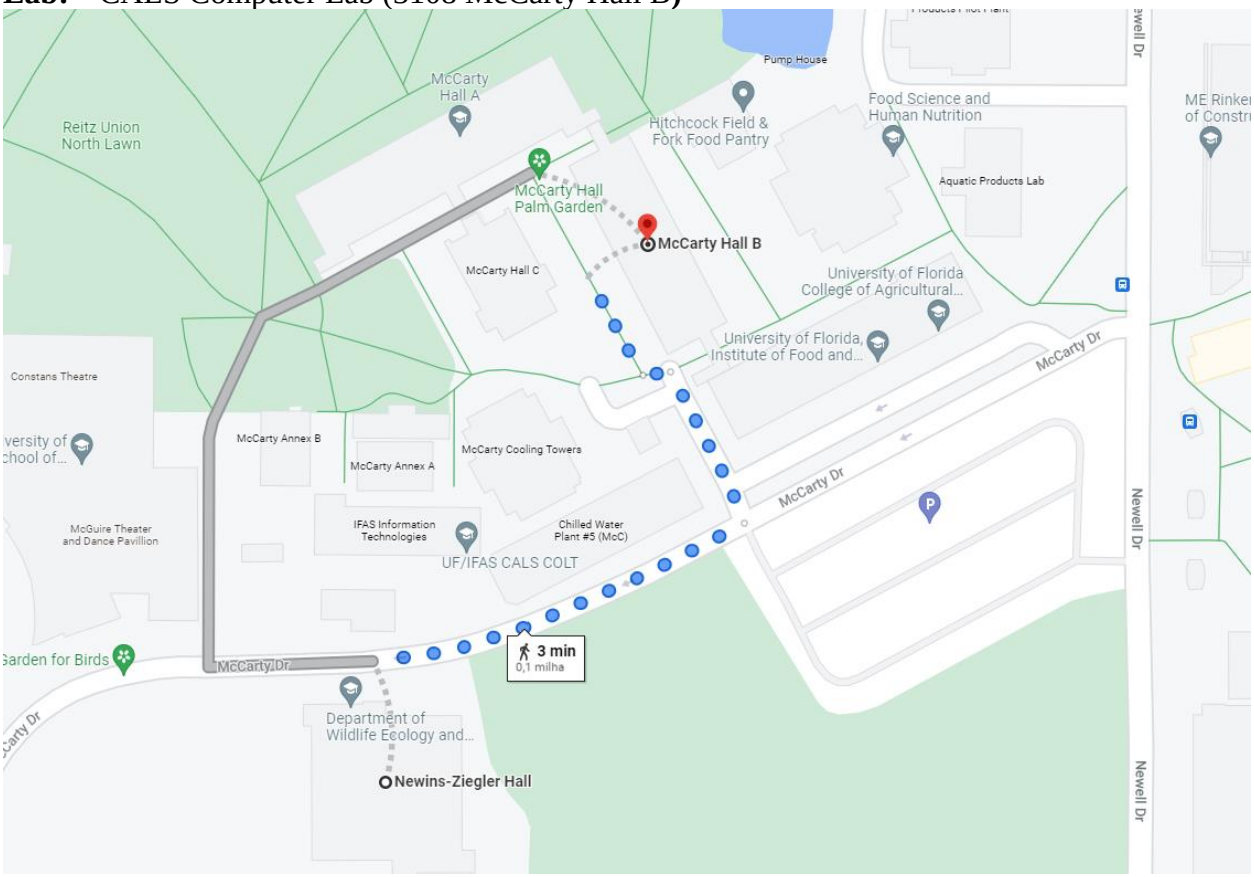
The UF Religious Holidays Policy is available at:
https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/#religiousholidaystext
At the University of Florida, students and faculty work together to allow students the opportunity to observe the holy days of their faith. A student should inform the faculty member of the

religious observances of their faith that will conflict with class attendance, with tests or examinations, or with other class activities **prior to the class or occurrence of that test or activity**.

Additional Information

- Map of lecture and lab location

Lecture: 1745 McCarty Drive / 138 Newins-Ziegler Hall – Class Room 0219
Lab: CALS Computer Lab (3108 McCarty Hall B**)**



FOR3430C: Forest Mensuration: 2024 Spring Class Schedule

(Sequence and topics subject to change)

Week		Topics	Readings	Assignment/Due Date/Value
1	Jan 17	Course Introduction, Why do we cruise? & Forest Inventory Project	Ch 1	Lecture Notes 1 / 5 pts
2	Jan 24	Basic Statistical Concepts & HW1	Ch 2	Quiz 1 / 5 pts Lecture Notes 2 / 5 pts
3	Jan 31	Land Measurements & Tree Measures I	Ch 4, Ch 7	Quiz 2 / 5 pts HW 1 / 25 pts Lecture Notes 3 / 5 pts
4	Feb 7	Tree Measures II & HW2	Ch 7	Quiz 3/ 5 pts Lecture Notes 4 / 5 pts
5	Feb 14	Tree Volume I	Ch 8	Quiz 4/ 5 pts HW 2 / 25 pts Lecture Notes 5 / 5 pts
6	Feb 21	Tree Volume II & Log Rules & Log Scales & HW3	Ch 6, Ch 8	Quiz 5 / 5 pts Lecture Notes 6 / 5 pts
7	Feb 28	Stand Parameter & HW4	Ch 15	Quiz 6/ 5 pts HW 3 / 25 pts Lecture Notes 7 / 5 pts
8	Mar 7	Sampling Forests - Fixed Area Plot & HW5	Ch 10	Quiz 7/ 10 pts HW 4 / 25 pts Lecture Notes 8 / 5 pts
9	Mar 14	Sampling Forests - Variable Radius Plot & HW6	Ch 11	Quiz 8/ 5pts HW 5 / 25 pts Lecture Notes 9 / 5 pts
10	Mar 21	**SPRING BREAK**		
11	Mar 28	Sampling Design in Forest Inventories & HW7-8 **Guest speaker: (Dr. Gabriel Prata – Forest Geospatial Analyst at The Westervelt Company)**	Ch 3	Quiz 9/ 5 pts HW 6 / 25 pts Lecture Notes 10 / 5 pts
12	April 4	Remote Sensing in Forest Mensuration **Guest speaker: Trevor Host (Manager, Remote Sensing at Rayonier)**	Ch 12	Quiz 10/ 5 pts HW 7-8 / 50 pts Lecture Notes 11 / 5 pts
13	April 11	Tree Growth and development/ Stand Growth and Yield Models **Guest speaker: Marshall Hilto – F4Tech** **Dr. Eben Broadbent - UF**	Ch 13-14	Quiz 11/ 5 pts Lecture Notes 12 / 5 pts
14	Apr 18	**Guest speaker: Dr. Cristian Montes (Director Forest Systems at Rayonier)**	Ch 16 & Ch 17	Quiz 12/ 5 pts Lecture Notes 13 / 5 pts
15	Apr 25	Forest Inventory Project presentation - ACF	Forest Inventory report 230 pts	Quiz 13/ 5 pts Lecture Notes 14 / 5 pts
All assignments & topics are subject to change				

FOR3430C : Forest Mensuration : 2024 Spring Lab Schedule (Sequence and topics subject to change)				
Week		**Topics**	**Assignment/Due Date/Value**	**Location**
1	Jan 17	Lab 1 Principles of Measurements		Computer Lab
2	Jan 24	Lab 2 Stats review	Lab 1 - Jan 31 /18 pts	Computer Lab
3	Jan 31	Lab 3 Pacing and compass	Lab 2 - Feb 7 /18 pts	ACF
4	Feb 7	Lab 4 Tree measures	Lab 3 - Feb 14 /18 pts	ACF
5	Feb 14	Lab 5 Tree Volume	Lab 4 - Feb 21 /18 pts	Computer Lab
6	Feb 21	Lab 6 Sawmill Tour	Lab 5 - Feb 28 /18 pts	Great South Timber & Lumber, LLC.
7	Feb 28	Lab 7 Forest Inventory Project	Lab 6 - Mar 7 /18 pts	Computer Lab
8	Mar 7	Lab 8 Fixed Area Plot	Lab 7 - No assignment	Millhopper
9	Mar 14	Lab 9 Variable Radius Plot	Lab 8 - Mar 28 /18 pts	ACF
10	Mar 21	**SPRING BREAK**		
11	Mar 28	Lab 10 Forest Inventory Project	Lab 9 - April 4 /18 pts	ACF
12	April 4	Lab 11 Forest Inventory Project	Lab 10 - No assignment	ACF
13	April 11	Lab 12 Forest Inventory Project	Lab 11 Forest Inventory Project - preliminary report - Apr 11 /36 pts	ACF
14	Apr 18	Lab 13 Forest Inventory Project	Lab 12 - No assignment	ACF/Computer Lab
15	Apr 25	Lab 14 Forest Inventory Project presentation - ACF	Forest Inventory report 230 pts	Computer Lab
All assignments & topics are subject to change				