

Forest Mensuration

FOR 3430C

Spring 2021

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Office Hours: Tue & Thur 9:00 – 10:00 or email for appointment.

Lecture Schedule: Online (asynchronous)

Lab Schedule: Wednesday Period 7 - 9 (1:55 PM - 4:55 PM)

Lab Location: While exact location may vary, in general we will be meeting at the Austin Cary Forest (due to COVID safety concerns, students are encouraged to provide their own transportation to lab sites)

“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. Pin hookers make money on landowners with bad data. (Barrett McCall, President Larson & McGowin).

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 does solid wood volume relate 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?

Course 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 Excel spreadsheet skills.

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 on-line prior to lecture. It is to your advantage to read these articles as they will often reinforce information given in lecture, 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.
- **Quizzes:** 10 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 to informally quiz each other on the course material presented.
- **Individual Study:** Each student will be expected to watch lectures online and attend 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.

Required Text

Forest Measurements, Sixth Edition. John A., Burkhart, Avery and Bullock, Waveland Press Inc. 2019

ISBN: 978-1-4786-3618-2

Grading

<i>Quizzes (10 @ 5 pts each):</i>	50 pts
<i>Lab Reports (Variable 3 - 12 pts each):</i>	50 pts
<i>Total:</i>	100 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.

Lab Reports: 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	93.0 - 100	90.0 - <93.0	87.0 - <90.0	83.0 - <87.0	80.0 - <83.0	77.0 - <80.0	73.0 - <77.0	70.0 - <73.0	67.0 - <70.0	63.0 - <67.0	60.0 - <63.0	0 - <60.0
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) and Dendrology (FNR 3131C).

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 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 11:59pm 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 exams 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 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 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://fmeal.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 on-line 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 are 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.

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.**

FOR3430C: Forest Mensuration: 2021 Spring Class Schedule

(Sequence and topics subject to change)

Week		Topics	Readings	Activity Due (5 pts)
1	Jan 12 / 14	Course Introduction, Why we cruise?	Ch 1	
2	Jan 19 / 21	Stats Review I & II	Ch 2,	
3	Jan 26 / 28	Stats Review III, Land Measurements (Dewitt)	Ch 3	
4	Feb 2 / 4	Tree Measures I & II	Ch 6	Feb 4: Quiz 1 Stats
5	Feb 9 / 11	Tree Volume I & II	Ch 4	
6	Feb 16 / 18	Sampling Design I & II	Ch 8	Feb 18: Quiz 2 Tree Measures
7	Feb 23 / 25	Stand Level Parameter I & II	Ch 9	Feb 25: Quiz 3 Sampling Design
8	Mar 2 / 4	Fixed Area Plot & Workup	Ch 11	Mar 4: Quiz 4 Stand Parameters
9	Mar 9 / 11	Variable Radius Plot & Workup	Ch 12	
10	Mar 16 / 18	Inventory Design, Reporting/Stand Tables, Workup Seedling Cruise	Ch 14	18 Mar: Quiz 5 Plots
11	Mar 23 / 25	Timber Products, Markets, Value: Tree Growth	Ch 15	25 Mar: Quiz 6 Timber Products
12	Mar 30 / Apr 1	Stand Growth: Workup Pulpwood Cruise		1 April: Quiz 7 Tree/Stand Growth
13	Apr 6 / 8	Growth and Yield Models; FIA Inventory	Ch 16	8 April: Quiz 8 G & Y Models
14	Apr 13 / 15	Rayonier Presentation: Workup Mixed Product Cruise		13 April: Quiz 9 Inventory
15	Apr 20	Urban Forest Inventory		20 April: Quiz 10
		All assignments & topics are subject to change		

FOR3430C : Forest Mensuration : 2021 Spring Lab Schedule

(Sequence and topics subject to change)

Week		Topics	Assignment/Due Date/Value
1	Jan 13	Lab Orientation	
2	Jan 20	Lab 1 Pacing	
3	Jan 27	Lab 2 Compass and GPS	Summary/3 Feb/3 pts
4	Feb 3	Lab 3 Mapping in the field	Map/10 Feb/3 pts
5	Feb 10	Lab 4 Stem & Height (Crown) Measures	Summary/17 Feb/3 pts
6	Feb 17	Lab 5 Field Measures vs. Cut: Form Class: Products	Summary/24 Feb/3 pts
7	Feb 24	Lab 6 Sawmill Tour	Summary/3 Mar/3 pts
8	Mar 3	Lab 7 Fixed Radius Plot	Workup/10 Mar/3 pts
9	Mar 10	Lab 8 Point Sampling	Workup/17 Mar/3 pts
10	Mar 17	Lab 9 Seedling Survival Cruise	Map, Workup, Recommendations/24 Mar/7 pts
11	Mar 24	Lab 10 Pulpwood Plantation Cruise	
12	Mar 31	Lab 11 Check Cruise	TPA, BA, Vol/Acre, Stand Table/7 April/10 pts
13	Apr 7	Lab 12 Mixed Products Stand Cruise	
14	Apr 14	Lab 13 Check Cruise	
15	Apr 21	Hardwood	TPA, BA, Vol/Acre by Product & Value Estimate/26 April/12 pts
All assignments & topics are subject to change			