

**FRSC 3162/6164--Silviculture**  
**School of Forest, Fisheries, and Geomatics Sciences**  
**University of Florida**

<b>Course title and number</b>	Silviculture FRSC 3162/6164
<b>Term</b>	Spring 2023
<b>Meeting times and location</b>	M 11:45 AM-12:35 PM NZ 222 We will meet at Austin Cary on most days for class at 11:45 am. Field meetings will run into lab time W 12:50-1:40 pm 6th period, TUR2353 F 11:45 AM-12:35 PM 5th period, NZH0219  Laboratory Monday 6-9 <sup>th</sup> periods (12:50-4:55 PM; NZ 222) <b>see schedule below</b>
<b>Prerequisites</b>	FOR 3153C or PCB 3043, FNR 3131C or Instructor Approval
<b>Course Overview</b>	Designed for students in their junior year or graduate students with little to no prior silviculture coursework.

**Instructor for 3162/6164**

Name Jason G. Vogel  
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 Office hours Wednesday after class: 1:45-2:45 pm  
 Room 365 Newins-Ziegler Hall. Also happy to meet online!

**Course Description**

This course covers the theories and practices that pertain to managing for forest establishment (natural and artificial regeneration), composition, structure and growth. The principles of sustainable forest management will be covered for a broad array of ecosystem values and social and ecological benefits, including forest products, ecological restoration, wildlife, biodiversity, and ecosystem services. In aggregate, these topics broadly cover the art and science of silviculture.

The course has a lecture and laboratory component. The lectures have a traditional powerpoint structure with classroom discussion of readings and online material. When online materials are available for review it will be announced in class. The laboratory occasionally has scheduled in-class computer work, and field trips to meet with forestry professionals. Student presentations will be assigned both for the lab and the class periods.

**Learning Outcomes/Course Objectives (1-4) and Student Skills (a-c)**

At the end of this course, students will be able to:

1. Design silvicultural applications for sustaining forest ecosystem goods and services.

- a. Compare and contrast forest stand management options for different landowner objectives.
  - b. Describe appropriate uses of fire, mechanical, and chemical methods in forestry and their environmental consequences.
  - c. Ability to contrast methods of ensuring tree regeneration, guiding stand development, and using appropriate harvesting methods based on landowner objectives.
2. Interpret, present, and defend conclusions about silvicultural approaches both orally and in writing.
    - a. Prepare a written/oral paper or report.
  3. Apply basic concepts in statistics and sampling methods to develop sampling designs and collect, analyze, and interpret natural resources inventory and monitoring data.
    - a. Collect, analyze, and interpret forest resource data.
  4. Demonstrate environmental stewardship and professional and ethical behavior.
    - a. Identify practices that adhere to ethical and professional standards of forestry.

### Resource Material

**Assigned Reading Material will be found weekly in the Course Module**

#### **Suggested Reading (no required text)**

The Practice of Silviculture: Applied Forest Ecology (9<sup>th</sup> Ed.) D.M. Smith, B.C. Larson, M.J. Kelty, and P.M.S. Ashton. 1997. John Wiley, 537 p. ***This book is recommend for those looking to become professional forest managers and is a great resource for this class. Suggested chapters are noted in the Canvas modules but these are not required.***

Forest Stand Dynamics. Chadwick and Oliver. 1996. McGraw Hill.

Silviculture: Concepts and Applications. R.D. Nyland.1996. McGraw Hill 633 p.

#### **Free, useful material**

Burns R.M. and B. H. Honkala. 1990. Silvics of North America. U.S.D.A. Forest Service, Agric. Hdbk. 654.

#### **AVAILABLE ON WEB**

**The Silvics of North America** [http://www.na.fs.fed.us/spfo/pubs/silvics\\_manual/table\\_of\\_contents.htm](http://www.na.fs.fed.us/spfo/pubs/silvics_manual/table_of_contents.htm)

#### **Class Policies**

- 1) Much of your laboratory work will be done with a group of your peers (3-4 persons/ group). Your work and time together will occur out of my sight and so it is worth revisiting this section of the student honor code:

***Respect for people and property. Students are encouraged both to conduct themselves in a manner that exemplifies respect for all people and property and to adhere to their personal values without imposing those on others.***

- 2) **The class motto for the semester is REMAIN FLEXIBLE! And Be Safe!** Communicate with me on any problems you might have and I will do the same. Usually, I do not answer emails on the weekend. Never

come to a class if you think you might be sick or exposed to someone who has. I promise you, an absence will not hurt your grade.

- 3) If I am sick, I will try to continue with zoom meetings and will announce in class if that is the case.
- 4) During field labs, I might be videotaping or taking pictures of the class that I will then share with the students who cannot attend in person. Let me know if you are uncomfortable with being in a picture and I will obviously respect that.
- 5) Plan to do 6-7 hours of work per week beyond class time if you would like a 'higher' grade.

### Grading Policies

- 1) **Participation, syllabus quiz, and group work plan (25 pts)**. Attend class and labs, take 'ungraded' quizzes, respect your peers.
- 2) **Describe a forest (45 pts)**. This will involve you describing a forest iteratively over a semester, adding details that I will assign and describe to you. Ideally, you know the forest well-enough or can access it so that you can add the details that I will request at each iteration. (3x at 15 pts).
- 3) **Online Quizzes (160 pts)**. (20 pts per quiz x 8 quizzes). Do as an individual online. These will mostly derive from the week's lectures and lab. There are actually 10 quizzes available but you only need to do 8. If you do all 10, then your top 8 scores will be used for the grade. The quizzes are timed for 45 minutes.
- 4) **Exams (200 pts)**: These will be cumulative up to the point of the exam. Graduate students will have an online option, undergrads will have an in-person exam.
- 4) **Laboratory exercises (200 pts or 50 pts each / four reports)**. Each of you will be assigned a section of a lab report to do. This individual work will be ~70% of your grade, 20% will be a group question, and ~5% will come from your group's assessment of your help in pulling together the whole report. **The 20% assessment on group work cannot decrease your grade. So if your individual work and peer assessment was an 'A' you will receive an 'A' for that assignment regardless of what your peers had done on the rest of the assignment.**
- 5) **Development of silvicultural prescription (70 pts)** and an in-person or zoom (online graduate students) presentation of silvicultural prescriptions (**80 pts**). The prescription is individually graded by section and the presentation is a combined individual and team graded exercise. **But similar to the above, any group grades cannot lower your grade.** Note that part of your grade will be your participation and grading of other's work, and the grade you receive from your teammates. To

receive your final grade on the silvicultural prescription, your group must answer the questions posed to you during the oral presentations and in your text.

**Graduate students** will form their own group(s) and develop a silvicultural prescription focused on a forest ecosystem or management type that is relevant to their interests. There will be additional readings and more extensive prescription expected. Presentations of the silvicultural prescription will occur online. Online graduate students will only provide a written report.

7) **No “extra” extra credit** will be assigned to individuals. Extra credit during the semester will only be made available to the entire class.

8) **Grades** - The boundaries for each grade (% of total points) are:

<b>A</b>	<b>93-100%</b>	<b>C</b>	<b>73-76%</b>
<b>A-</b>	<b>90-92%</b>	<b>C-</b>	<b>70-72%</b>
<b>B+</b>	<b>87-89%</b>	<b>D+</b>	<b>67-69%</b>
<b>B</b>	<b>83-86%</b>	<b>D</b>	<b>63-66%</b>
<b>B-</b>	<b>80-82%</b>	<b>D-</b>	<b>60-62%</b>
<b>C+</b>	<b>77 -79%</b>	<b>F</b>	<b>&lt;60%</b>

### Lecture Outline

Week (approximate) topic and focus of lectures. Weekly readings will be posted on the first Monday of week of classes and a list for the semester is found at the end of the syllabus.

- I. Silviculture as a Part of Forestry
  - a) Lectures: Introduction, Forest measurements and terminology, Public vs. Private forestry, Ecological vs Plantation forestry
- II. Stand Development, Forest Composition and Stand Structure
  - b) Forest composition, stand development, stand structure
- III. Landuse Ethics and Public sector forest management
  - c) Online Video, Ethics lecture
- IV. Site Quality Evaluation - Purpose and Methods
  - d) Site index, soil and site quality, and estimating growth
- V. Tending and Intermediate Cuttings
  - e) Thinning Concepts and Thinning Effects, Methods and Application of Thinning
  - f) Release Cuttings, Cleanings and Liberation Cuttings
  - g) Herbicide Treatments in Silviculture, Herbicide Fate in the Environment
  - h) Improvement Cuttings, Salvage and Sanitation Cuttings, Pruning
- VI. Reproduction Methods and Silvicultural Systems
  - i) Clearcutting, Coppice, Seed Tree and Shelterwood
- VII. Forest - Wildlife Interactions
- VIII. Tree Nutrition and Forest Fertilization
  
- IX. Regeneration Activities and Fire management
  - j) Preparation and Treatment of the Site, Mechanical, Chemical and Prescribed Fire
- X. Ecology of Regeneration
  - k) Seed Biology and Seed Ecology, Fire for release, Tree Improvement and Species Selection

XI. Artificial Regeneration

l) Direct Seeding and Planting

XII. Multiple Use Silvicultural Systems and Adaptive Management

m) Management tradeoffs and public-private overlaps

n) Diversity, Watershed protection, Profit

**Laboratory Notes and Schedule**

The majority of the field laboratory exercises held will occur at the Austin Cary Forest but also the Millhopper campus. Read each laboratory exercise prior to coming to the field class, or if working online, before the following week discussion. Note: The procedures for all laboratory exercises will be located on the silviculture course Canvas page.

You will also be responsible to come prepared for the elements, which includes: wearing long pants and boots, and bringing rain gear when appropriate. **For your protection, hard hats will be worn during all field exercises. Snake leggings can be provided, or your personal 'snake' boots are recommended.** Equipment will be assigned at the beginning of the semester to each person, and to lab groups at the beginning of each class. **Lightning or high-winds will cause us to cancel a trip, but light rain or cold, and we will still go out.**

<b>Laboratory Schedule. Note there will need to be some flexibility around field trips dates because of weather or our cooperator's availability.</b>			
<b>Date</b>	<b>Topic</b>	<b>Location</b>	<b>Week</b>
9-Jan	Forest measurements / Calculations	Campus	1
16-Jan	No lab—MLK Day	---	2
23-Jan	Stand structure / Composition lab	ACF	3
30-Jan	Soils overview	ACF	4
6-Feb	Site Productivity Lab	ACF	5
13-Feb	Discuss Site Productivity Lab	ACF	6
20-Feb	Thinning Lab Introduction	ACF	7
27-Feb	Discuss Thinning Lab	ACF	8
6-Mar	Regeneration Lab	ACF or Millhopper	9
13-Mar	Spring break	----	10
20-Mar	Understory / overstory management	ACF	11
27-Mar	Discuss regeneration and overstory	ACF	12
3rd-Apr	Mystery field trip	Mystery field trip	13
10-Apr	Silviculture Prescription Assignment	ACF	14
16 <sup>th</sup> 17th-Apr	Optional Trip to Jones Center (\$25 / student)	In-person	15
24-Apr	Silvicultural Presentation	In-person	16
<b><i>Finals / Reading Days--There is no final in the class, but the final written prescription is due during final's week. Please see class Canvas calendar for the exact date.</i></b>			

<b>Points and percentages for each class activity</b>		
<b>Activity</b>	<b>Points</b>	<b>Percentage</b>
Participation	25	3.2
Describe a forest	40	5.2
Quizzes		
Online	160	20.6
Exams		
Week 7*	100	12.9
Week 12*	100	12.9
<b>Laboratory Exercises<sup>&amp;</sup></b>		
1. Stand Struct. & Comp.	50	6.5
2. Site Qual. Eval.	50	6.5
3. Thinning	50	6.5
4. Regeneration	50	6.5
<b>Silvicultural Prescription</b>		
Presentation <sup>†</sup>	70	9.0
Report	80	10.3
Total points	775	100
*Graduate students will have online exams. Undergrads will be in person.		
<sup>&amp;</sup> Graduate students will not perform the laboratory work. Reading from a laboratory will be part of 'online' quiz.		
<sup>†</sup> Graduate students will not provide a silvicultural prescription presentation but will do the report.		

### **Americans with Disabilities Act (ADA)**

#### **Accommodations for Students with Disabilities:**

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.

Resources are available on-campus for students having personal problems or lacking clear career and academic goals which interfere with their academic performance. These resources include:

1. University Counseling Center, 301 Peabody Hall, 392-1575, personal counseling;
2. Student Mental Health, Student Health Care Center, 392-1171, personal counseling;
3. Sexual Assault/Abuse Recovery Education, Student Health Care Center, 392-1161 x231, assist with sexual assault issues;

4. Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling.

#### **Code of Conduct**

All students are expected to abide by the Student Honor Code as described in the Student Handbook (<https://sccr.dso.ufl.edu/wp-content/uploads/sites/4/2020/12/Orange-Book-Web-Version-2020.pdf>). Students are expected to behave in a professional and courteous manner towards the instructor and other classmates. This includes turning off AND putting away your cell phone during class.

Plagiarism (<http://web.uflib.ufl.edu/msl/subjects/Physics/StudentPlagiarism.html>) can result in a reduced grade, failure of the course, and possible dismissal. Plagiarism includes: 1) the direct use of any written material (be careful with 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 (<https://www.dso.ufl.edu/%20sccr/process/student-conduct-honor-code>).

No alcohol or illegal drug use is allowed during field excursions or on the overnight trip. Chewing tobacco use should be unobtrusive (no spit cups in vans!), and cigarette use is not allowed because of fire risk.