

## FRSC 3162/6164--Silviculture

### School of Forest Resources and Conservation, University of Florida

<b>Course title and number</b>	Silviculture FRSC 3162/6164
<b>Term</b>	Spring 2020
<b>Meeting times and location</b>	Lecture MW (5th period NZ 222; 11:45 AM-12:35 PM) F (5th period NZ 219)  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
Telephone number	352 846 0879
Email address	<a href="mailto:jvogel@ufl.edu">jvogel@ufl.edu</a>
Office hours	Wed 1-2 pm fixed; otherwise open door or by appointment
Office location	Room 365 Newins-Ziegler Hall

#### 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. Demonstrate an ability to acquire, interpret, and present 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

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

**Primary source.** 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 syllabus 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.

Silvics of North America. Volume 1. Conifers, Volume 2. Hardwoods. 1990 (R.M. Burns and B. H. Honkala, Tech. Coord.) 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). For the first two lab assignments, I will assign group members during each lab week based on prior coursework. For the remaining laboratory assignments and the final report, you will chose your groups.
- 2) Class attendance is mandatory for Monday morning classes and Monday laboratories. However, attendance is highly recommended for all class periods. I expect that you will arrive having read the assigned material or viewed coursework posted online prior to class. This is also the case for the Wednesday and Friday class, but attendance these days is not mandatory. ***I will have periodic in-class oral and written quizzes that are meant to evaluate your mastery of the material and encourage attendance. If you cannot make a class period, please let me know.***
- 3) Monday in-class we will have quiz on days that we have a field lab. These quizzes will draw from the lab material. Oral question and answer sessions will be performed on other days during the semester.
- 4) Computers can be used to take notes during class; however, I require that you not watch videos on your phone or laptop. It is distracting to your classmates. Texting or talking on the phone during class is distracting and not permitted. No videotaping of guest speakers or my lectures without my permission.

### Grading Policies

- 1) Participation and attendance **(2.5% of total)**. A missed Monday class, laboratory or field day\*, or a guest speaker ***will result in an automatic loss of 2.5% the participation grade, except in the case of verified university excused absence or approval from instructor prior to absence.*** Texting during a

guest speaker’s presentation, field or lab, will result in a loss of some points. Other participation points are making an effort to answer questions during a question and answer session or making the entire group wait for lab departure. \*Individuals who cannot make the overnight Jones Center trip can opt-out but must attend the Forest Service day (see schedule below).

2) Examinations covering lectures, laboratory topics, and assigned readings (Mid-Term I- 10%; Mid-Term II - 10%, Mid-Term III -10%)(**30% of total**). Exams will cover lecture, readings, and laboratory material. Exams are effectively cumulative because the material learned earlier in the semester will need to feed into later sections of the class. **A final comprehensive exam is optional for this course and can be used to replace one mid-term grade.**

3) Satisfactory completion of four laboratory reports and preview quizzes (**30% of total**). You must turn in your lab on the designated day. Lab sections will have three graded components: (Approximate breakdown: 50% online pre- or post lab quiz (individual); 30% overall group report; 20% peer evaluation of contribution, effort and professionalism). Groups will be randomly assigned for interim reports.

4) Development of silvicultural prescription (**15% of total**) and a presentation of silvicultural prescriptions (**12.5% of total, individually and group graded**). The prescription is individually graded and the presentation is a combined individual and team graded exercise. 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.

5) Quizzes (**10% of total**). Quizzes will be in class or online. Frequency will depend on whether the class is keeping up with material.

6) **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.

7) Examinations must be taken when scheduled, except in the case of verified university excused absence.

8) Any late work on class assignments will be lowered by 10% for each day it is overdue, except in the case of verified university excused absence.

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

10) 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
- 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

**Review: 2/5/20 (during lecture period)**

**Exam 1: 2/7/20**

- 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

**Review 3/11/20**

**Exam 2: 3/13/20**

- 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

**Review 4/8/20**

**Exam 3: 4/10/20**

**Reading Days 4/23 and 4/24/2020**

**Optional final exam 4/30/2020 at 10 am in the same room as the class.**

### Laboratory Notes and Schedule

Approach the labs as professionals attempting to do a job. So this means do not do distracting or unsafe things, some examples pushing over dead trees, interacting with or harassing wildlife, distracting your lab mates or otherwise acting in an unprofessional or unsafe manner. When we are meeting with outside professionals, restrict cell phone use when we are in groups and discussing a topic. When an outside host is speaking, please be attentive. Your behavior will reflect on all of your classmates. The majority of the laboratory exercises will be held in the field at the Austin Cary Forest. You are required to read and comprehend each laboratory exercise prior coming to class. An online quiz will

open before each field lab and you are expected take this quiz. Note: The procedures for all laboratory exercises will be located on the silviculture course web site.

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 or your personal ‘snake’ boots are highly recommended.** Equipment will be assigned at the beginning of the semester to each person, and to lab groups at the beginning of each class. Each crew is responsible for the use, care, and replacement of all lost equipment used during the laboratories. **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>
6-Jan	Skills evaluation / Organization	NZ 222
13-Jan	Field tour of intensive and extensive forestry sites (Description exercise, Graded as ‘Quiz’)	Meet in 222 and then drive to Austin Cary Forest.
20-Jan	No Class—MLK Holiday	
27-Jan	Understanding Stand Structure ( <b>Graded Lab 1</b> )	Austin Cary Forest (ACF). Vans leave promptly from NZ.
3-Feb	Site Quality Evaluation ( <b>Graded Lab 2</b> )	Austin Cary Forest
10-Feb	Thinning Lab ( <b>Graded Lab 3</b> )	Austin Cary Forest
17-Feb	Thinning oral report (continued)	Austin Cary Forest
24-Feb	Local field trip with alternative instructor	TBD
2-Mar	Spring break	
9-Mar	Visit with industrial cooperators	Tour industrial plantation forestry operations
16-Mar	Visit with United States Forest Services. This field trip is optional for everyone except for those who cannot go to the Jones Center trip.	Depart NZ promptly Sunday, March 31 <sup>st</sup> at 10 am. Bring \$15 for housing; money for dinner
23-Mar	Regeneration survey lab ( <b>Graded Lab 4</b> )	ACF
29-30 <sup>th</sup> Mar	Jones Ecological Research Center at 10 am return 5:00 pm March 30 <sup>th</sup> . (optional)	Depart NZ parking lot
6-Apr	Silvicultural Prescription Field Collection	ACF
13-Apr	Silvicultural Prescription Field Collection	ACF
20-Apr	Presentation of silvicultural prescriptions (also in class)	NZ 222

<b>Lab</b>	<b>Due Dates</b>
Stand Structure and Composition	Feb. 4th
Site Quality Evaluation	Feb. 11th
Thinning Lab	Feb. 25th
Regeneration Lab	Apr. 8th
Silvicultural Prescription Report	Apr. 30th

Dates may need to be adjusted because of weather or illness.

<b>Points and percentages for each class activity</b>		
<b>Activity</b>	<b>Points</b>	<b>Percentage</b>
Participation	25	2.5
Exam 1	100	10
Exam 2	100	10
Exam 3	100	10
<b>Laboratory Exercises</b>		
1. Stand Struct. & Comp.	65	6.5
2. Site Qual. Eval.	70	7
3. Thinning	90	9
4. Regeneration	75	7.5
Quizzes	100	10
<b>Silvicultural Prescription</b>		
Report	150	15
Presentation	125	12.5
Total points	1000	

### **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 (<http://www.registrar.ufl.edu/catalog/policies/students.html> ). 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.

The readings below are recommended. Other reading material may be made available during a given week and this will show up on Canvas.

#### **Reading List**

<b><u>Week</u></b>	
Week 1	Chapter 1, Smith
Week 2	Chapter 2, Smith
Week 3	Aldo Leopold chapter; Meyer 1997
Week 4	Chapter 9, pp 234-248, Smith
Week 5	Chapter 3, 4 Smith
Week 6	Chapter 5, 6 Smith
Week 7	Chapters 20 Smith
Week 8	Jokela et al. 2010
Week 9	Chapter 6, 8
Week 10	Chapter 7, Smith
Week 11	Chapter 10, Smith
Week 12	Chapter 16, Smith
Week 13	Chapter 18, Smith
Week 14	Chapter 17, Smith
Week 15	No reading