

FORS 347 - MULTIPLE RESOURCE SILVICULTURE

Spring 2020

Tu, Th 10:00-10:50 in Forestry 106

Lead Instructor – Chris Keyes

- Forestry Building room 208A. I supervise the college's field properties – Lubrecht Experimental Forest and Bandy Experimental Ranch – and am at them frequently.
- Office Phone 406-243-6051; Email christopher.keyes@umontana.edu.
- OFFICE HOURS: Thursdays 11:00am-1:00pm, and by appointment. *Schedule an appointment in advance whenever possible.*

Teaching Assistant – Luke Rymniak

- Email luke.rymniak@umontana.edu.
- OFFICE HOURS: Forestry 207; Wednesdays and Fridays 11:00am-1:00pm, and by appointment. *Schedule an appointment in advance whenever possible.*

Course Description

From the catalog: “An introduction to the concepts and application of silvicultural techniques to forest ecosystems to meet multiple resource objectives.” This course deals with the culture of trees in forest stands. It provides an overview of silvicultural principles and practices, and their application to control the establishment, structure, and development of forest stands to satisfy a range of possible objectives (biological, economic, and social) by drawing on an understanding of forest stand dynamics and patterns of stand development. All silviculture is local; practices and examples from other regions will be included, but the primary emphasis is on the application of silvicultural treatments to forests of western North America.

10 Course Objectives – Knowledge, Skills, and Abilities

1. Be familiar with the components of silvicultural systems and silvicultural prescriptions. Possess the ability to prepare and quantitatively contrast silvicultural alternatives.
2. Understand western U.S. tree identification, silvics, properties, and uses
3. Be able to characterize stands with qualitative descriptions and quantitative measures of trees and forest stand structure
4. Be familiar with soil properties and their relation to forest growth and site quality.
5. Understand concepts of forest stand dynamics and their relation to silvicultural practices. Be familiar with the development patterns of pure and mixed forest stand types.
6. Understand the proper conduct of intermediate (tending) treatments – thinning & pruning – and their effects on stand density, stand growth, and tree quality.
7. Understand even-age and uneven-age silvicultural systems (regeneration methods) and their variations for pure and mixed stands, for common Montana forest types.
8. Be knowledgeable of reforestation planning and practices. Understand elements of natural regeneration and the regeneration ecology of trees.
9. Be familiar with diverse applications of silviculture (including forest restoration) and regional variations in practices applied to various North American forest types.
10. Establish/refine skills in preparing professional reports and documents.

This is the overall class framework:

- Week 1 is launch week: Introduction to Silviculture; Stands and Stand Structures
- The remainder of the course is divided into 7 two-week Modules, each with a distinct theme and Featured Instructor
- Each Module consists of 3 lectures (Tues, Thurs, Tues), plus 1 or 2 labs (Tues)
- During the alternating Thursdays (between modules), Keyes takes back the helm to manage class issues, lecture, and set table for next module
- Exams at the conclusion of each Phase.

Phase I – Forestry Foundations (January & February)

Module 1 – Tree Biology, featuring Ed Burke

- Lectures on Jan 21 (Tues), 23 (Thurs) and 28 (Tues)
- Lab on Jan 28 (Tues) – UM Campus: Dendrology Walkie Talkie (NO VEHICLES)

Module 2 – Tree and Stand Metrics, featuring Dave Affleck

- Lectures on Feb 4 (Tues), 6 (Thurs) and 11 (Tues)
- Lab on Feb 4 (Tues) – UM Campus: Tree Measurements (NO VEHICLES)
- Lab on Feb 11 (Tues) – Field Trip: Stand Inventory (YES VEHICLES)

Module 3 – Forest Soils & Productivity, featuring Tom DeLuca

- Lectures on Feb 18 (Tues), 20 (Thurs); VOID on Feb 25 (Tues)
- Lab on Feb 18 (Tues) – Field Trip: Missoula Wastewater Poplar Plantation (YES VEHICLES)

Phase II – Silviculture Fundamentals (March)

Module 4 – Stand Tending Treatments, featuring John Goodburn

- Lectures on Mar 3 (Tues), 5 (Thurs) and 10 (Tues)
- Lab on Mar 10 (Tues) – Field Trip: TBD (YES VEHICLES)

Module 5 – Silvicultural Systems & Regeneration, featuring John Goodburn

- Lectures on Mar 24 (Tues), 26 (Thurs) and 31 (Tues)
- Lab on Mar 31 (Tues) – Field Trip: TBD (YES VEHICLES)

Phase III – Products & Services (April)

Module 6 – Ecosystem Applications, featuring Andrew Larson

- Lectures on Apr 7 (Tues), 9 (Thurs) and 14 (Tues)
- Lab on Apr 7 (Tues) – Field Trip: Baldy Mtn TNC – ‘ICO’ Method & RX Burning (YES VEHICLES)
- Lab on Apr 14 (Tues) – Field Trip: Gold Creek TNC – Hare Habitat & Novel PCT (YES VEHICLES)

Module 7 – Wood Products & Processing, featuring Ed Burke

- Lectures on Apr 21 (Tues), 23 (Thurs) and 28 (Tues)
- Lab on Apr 21 (Tues) – Field Trip: LEF Sawmill & Field Practicum (YES VEHICLES)
- Lab on Apr 28 (Tues) – UM Campus: Burke Lab Board Busting (NO VEHICLES)

Prerequisite Background

FORS 330 (Forest Ecology) or BIOE 370 (General Ecology; Formerly BIOL 340), minimum grade of C-. We apply some of the principles covered in other classes you POSSIBLY have taken previously – Tree Biology (FOR 210), Forest Biometrics (FOR 201), Forest Mensuration (FOR 302) – as well as those learned from related work or personal experience, etc.

Class Materials

- 1) Calculator: Bring some form of a calculator to each class. This is the part of the syllabus where later in the semester I remind you that you were supposed to bring a calculator to each class.
- 2) Readings: articles & text chapters will be delivered via email and/or posted to the class FTP website: **file://cfcweb/ftp\$/AFMP/FORS%20347%20SILVICULTURE/**
- 3) Supplemental Reference Texts (not required):
 - *The Practice of Silviculture – Applied Forest Ecology 10th edition* by Ashton & Kelty (2018, Wiley and Sons; ISBN 978-1119270959). Available at Amazon for \$100.40. **A copy is on reserve at Mansfield Library.** Earlier editions are also useful.
 - *Silviculture: Concepts and Applications, 3rd ed.* by Nyland (2016, Waveland Press).
- 4) For Every Field Lab: 1) a pocket field notebook, preferably with Write-in-the-Rain waterproof paper, 2) pencil, 3) clothes appropriate for the weather.
- 5) Protective Gear: Helmets and/or other personal protective gear are at your own discretion; they are available upon request. Any other safety and field equipment will be provided as necessary.

Online Materials

Lecture slides, readings, assignments, handouts and other class materials will be made available at the CFC'S ftp website. Carefully type this address into Google or your favorite web browser:

file://cfcweb/ftp\$/AFMP/FORS%20347%20SILVICULTURE/

From that page: just click on the file, download, and save.

Communications

Important class -related communications (lab cancellations, weather forecast notices, readings, updates, reminders, etc.) will be send electronically via email. We will use your formal UM email address for communication, so make sure that you check your UM email regularly, or have that email forwarded to another personal account if you use one.

Labs

1:10 up to 5:00pm, most (but not all) Tuesdays

There are 10 labs. Most (7) are field trips that will depart directly from Memorial Greenhouse. Remainder (3) will be held on campus; location will be announced for those.

- LABS HELD OUTDOORS – PREPARE FOR OUTDOOR WINTER CONDITIONS!
- Outdoor labs may run up to 5 pm. Let me know well in advance if you have a conflict.
- Altogether Lab grades add up to 30% of your overall grade.
- Missed Lab? It is impossible to repeat or reenact field labs. Accommodations will be made only in the case of medical or other family emergencies. If you miss a lab, meet with Luke for information.
- Makeups MAY be negotiable on a case-by-case basis, IF it is possible to arrange. Opportunities for lab replacements will be announced if/as they arise.

Exams & Assignments

Grade	⇒	A	B	C	D	F			
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%	⇒	100	90	80	70	60			

- 30% Midterm Exams (two; 15% each). *Be sure to have a calculator.* First midterm at the end of Phase I; second midterm at the end of Phase II. Mixed format: multiple choice, fill-in, calculations, short answer, etc. No curve except in unforeseen circumstances.
- 15% Lab Attendance. ~10 labs scheduled (tentative). Attendance counts 20% -- so show up!
- 20% Lab Assignments. ~10 lab assignments (tentative). Most labs will include Assignments – reports summarizing field trips or utilizing data collected. Lab Assignments are *due at start of following week's lab*, unless noted otherwise.
- 5% Lab Field Practicum. 1-hour field challenge at Lubrecht Forest on Tuesday, April 21st. Will be a short field test of your knowledge and skills accumulated during the semester.
- 30% Comprehensive Final Exam. Will draw on material from entire semester. Half on the Phase III content; half on Phases I and II content. Exam is 8-10am on Friday, May 8th.

Late Policies

- For any Assignment, lose ½ grade (5%) for each 24-hr period beyond deadline.

Special Dates

- Spring Break: March 16th – 20th
- Final Exam: Friday May 8th, 8:00-10:00 am

Students with Disabilities

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students. If you have a disability that adversely affects your academic performance, and you have not already registered with Disability Services, please contact them in Lommasson Center 154; phone 406-243-2243. I will work with you and Disability Services to provide an appropriate modification.

Academic Honesty

I expect you to earn your own grade. Plagiarism and any other violation of the Student Conduct Code WILL affect your grade. It may also result in disciplinary proceedings and possible sanctions. Become familiar with the University of Montana's Student Conduct Code. READ THE CODE, particularly Section V (Academic Conduct).

Grading Option Statement

This class is offered for traditional letter grade only (the credit/no credit option does not apply).

Course Withdrawal Deadlines

Deadline	Description	Date(s)
To 15 th instructional day	Students can drop classes on CyberBear with refund & no “W” on Transcript	February 3 rd 5:00pm
16 th to 45 th instructional day	A class drop requires a form with instructor and advisor signature, a \$10 fee from registrar’s office, student will receive a ‘W’ on transcript, no refund.	February 4 th through March 24 th 5:00pm
Beginning 46 th instructional day	Students are only allowed to drop a class under very limited and unusual circumstances. Not doing well in the class, deciding you are concerned about how the class grade might affect your GPA, deciding you did not want to take the class after all, and similar reasons are not among those limited and unusual circumstances. If you want to drop the class for these sorts of reasons, <i>make sure you do so by the end of the 45th instructional day of the semester.</i> Requests to drop must be signed by the instructor, advisor, and Associate Dean (in that order) and a \$10 fee applies. Instructor must indicate whether the individual is Passing or Failing the class at	March 25 th through May 1 st 5:00pm

Upper-Division Writing

This course is one of several approved upper-division writing courses in the forestry major. As such, assignments are designed to provide students with more experience at college level writing and grow in the following areas:

- Use writing to learn and synthesize new concepts
- Formulate and express written opinions and ideas that are developed, logical, and organized
- Compose written documents that are appropriate for a given audience or purpose
- Revise written work based on constructive feedback
- Find, evaluate, and use information effectively and ethically
- Begin to use discipline-specific writing conventions
- Demonstrate appropriate English language usage
- Identify and pursue more sophisticated questions for academic inquiry
- Find, evaluate, analyze, and synthesize information effectively from diverse sources
- Manage multiple perspectives as appropriate
- Recognize the purposes and needs of discipline-specific audiences and adopt the academic voice necessary for the chosen discipline
- Use multiple drafts, revision, and editing in conducting inquiry and preparing written work
- Follow the conventions of citation, documentation, and formal presentation appropriate to that discipline
- Develop competence in information technology and digital literacy