

FORS 347 MULTIPLE RESOURCE SILVICULTURE

Course Syllabus - SPRING 2024

Instructor Information:

Prof John Goodburn
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Office: Room 201A Forestry Building Email:
Telephone: 406-370-7257 (mobile/text)

Planned Office hours: Tuesday 2:00 - 4:30 pm
(or by advance appointment at time that works better for you)

Teaching Assistant:

Jessica Reyes jessica.reyes@umontana.edu
Office hours 1:00 - 2:00 pm Mondays in Rm 213 Stone Hall

Meetings:

Lecture and Discussion Tues. & Thurs. 10:00 -10:50 a.m. FOR Bldg Rm 106

Lab/Field Work Weds 1:00 - 4:50 p.m. UH Rm 210, OR in Field

Some initial Field labs will be on campus, while others will be at Lubrecht Experimental Forest and other sites around Missoula County. Course vehicles will be available for transport, but students may request to drive personal vehicles to some locations for personal reasons.

Course Description:

FORS 347 introduces 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.

Silviculture can be defined as the theory and practice of influencing forest regeneration, species composition, and growth to accomplish a specified set of resource objectives. We'll discuss ecologically-based forest management strategies aimed at sustainable wood production, wildlife habitat enhancement, watershed protection, and the maintenance of biological diversity, site productivity, & aesthetic quality.

We will examine the major ecological and conceptual foundations behind various silvicultural systems and vegetative management practices, and introduce students to their practical application in forest ecosystems of the Northern Rocky Mountains and elsewhere to meet multiple resource objectives. "All silviculture is local" in the sense that practices are specific to the ecology and ownership of the specific region. Practices and examples from other regions will be included, but the primary emphasis will be on the application of silvicultural treatments to forests of western North America.

Course Objectives - Knowledge, Skills, and Abilities:

1. Understand basic ecology of western forests and the silvics of major tree species, as well as the importance of the local site characteristics (soils, aspect, topography, climate and water availability) on variation in plant species composition and forest productivity.
2. Understand concepts of forest vegetation dynamics and their relationship to natural disturbances such as fire, insects and disease, or competition induced mortality.
3. Understand various silvicultural practices, including tree planting, thinning, prescribed fire, and commercial harvest, and become knowledgeable regarding how they might be used to address particular objectives.
4. Become knowledgeable regarding the proper conduct thinning & pruning treatments and their effects on stand density, stand growth, and tree quality.
5. Understand the opportunities natural regeneration and tree planting in relation to the site characteristics, and the regeneration ecology of specific tree species.
6. Be capable of interacting with professional silviculturists/foresters.

Readings

All Required Discussion Readings will be available via Moodle online. There is no required textbook, though we will primarily draw from the following texts:

- *The Practice of Silviculture – Applied Forest Ecology 10th edition* by Ashton and Kelty (2018, Wiley).
- *Ecological Silviculture – Foundations and Applications* by Palik et al. (2020, Waveland Press).

Additional background reading for this semester will come from other silviculture texts, along with journal articles or other materials. The objective is to provide readings electronically from selected chapters of these texts, journal articles, and other sources, which will be made available via Moodle.

Weekly Assignments

Most Thursdays, there will be an assignment for the week in review in addition to any readings for the upcoming week. These will generally be due the following Tuesday evening.

Moodle and Email will be will be the primary mechanism through which course materials, updates, assignments, news and readings are disseminated.

Labs

* For Off-campus Field Labs, we will often meet in front of the Campus Security Office just east of the Football Stadium (where campus parking administered). Some labs will be meeting indoors, particularly at the beginning of the semester. Such arrangements will be announced in class. The field lab exercises are considered an essential component of learning forest ecology and integrating various concepts discussed in lectures. Labs are designed to introduce you to many of the key methods used to characterize ecosystem composition, structure, and function.

* Attendance at all scheduled lab sessions is expected, and unexcused absences could negatively affect your grade. Please notify me as soon as possible if you will be unable to attend lab for some reason.

* Unless lab is scheduled to be indoors, always wear appropriate field clothes and footwear (boots) to labs. If rain, sleet, or snow are forecast, bring appropriate gear and do not expect lab to be canceled on account of bad weather.

Class Participation is encouraged and expected. Your preparation and willingness to ask questions and discuss various topics will benefit not only your own learning experience, but also that of your colleagues in the class. Approximately 2% of your course grade will be based on class participation.

Please Drop in or drop me a line. You are encouraged to ask questions and initiate discussions both in and out of class. No need to wait until exam to ask questions! I am available during office hours or other times (by advance appointment) if you cannot meet during posted hours. Please feel free to contact me via email to clarify questions.

Using Email to Contact me works much better for me than office phone, and we can often address questions through your email queries.

Grading System:

Periodic (~weekly) Assignments for Lecture & Lab	25%
Midterm Review Moodle Quizzes	10%,
Midterm exam	20%
Silvicultural Project/Paper Prescriptions	15%
Final Review Moodle Quizzes	5%
Final exam	22%
Class participation	3%

Final Grade will be based on a standard +/- grading scale (e.g., 80-82 = B-; 83-86 = B; and 87-89.5 = B+)

General Course Lecture Outline and Initial Readings

Tentative Lecture Schedule of Topics:

Week 1 Introduction to Course and Context of Silviculture in Forestry

Part I – Forestry Foundations

Week 2-3 Tree Biology, Forest Ecology, Variation in Forest Site Types
Silvics of Tree Species & Tolerance of shade, drought, frost

Part II – Objectives and Desired Conditions

Week 4-5 Vegetation Management for Alt Objectives
Stand Types, Composition & Structure Characterization

Part III – Silviculture Fundamentals: Thinning and Harvest Operations

Week 6-8 Forest Stand Dynamics, Natural Mortality, and Disturbance agents
Measures of Stand Density & Structure, Use of Stocking Guides
Forest Stand Tending Treatments – Commercial Thinning Methods
Midterm Review

Spring Break March 18-22

Week 9-10 Midterm Performance Exam March 27th during lab period
Stand Tending Treatments to meet various Objectives – Wildlife habitat
Precommercial Thinning and other Non-commercial Intermediate Treatments

Part IV – Regeneration Ecology and Silvicultural Systems

Week 11-13 Silvicultural Systems & Regeneration, Wildlife Habitat Considerations
Early Silviculture: Regeneration of Forests: Natural vs. Artificial Regen, Site Prep and other
Seed-Tree & SW Systems, Regen under partial retention harvests

Week 14-15 Developing Silvicultural Prescriptions to meet Multiple Objectives
or specific Ecosystem Applications

Finals Week Final Exam Performance Weds May 8th 8-10 am

Class Participation

Class participation is encouraged and will be incorporated into your grade. Your preparation and willingness to ask questions and discuss various topics will benefit not only your own learning experience, but also that of your colleagues in the class. Please feel free to ask questions and initiate discussions both in and out of class.

I will be available during office hours or at other times if you wish to schedule an alternative time. Also feel free to contact me or clarify questions you have via email. No need to wait until *after* an exam to ask questions!

Course guidelines and policies:

Students with Disabilities Statement <https://www.umt.edu/disability/>

Students with disabilities may request reasonable modifications by contacting ODE and myself. The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and the Office for Disability Equity (ODE). If you think you may have a disability adversely affecting your academic performance, and you have not already registered with ODE, please contact them. I will work with you and ODE to provide an appropriate modification.

Student Conduct Code Statement <https://www.umt.edu/student-affairs/community-standards/default.php>

- All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the https://www.umt.edu/student-affairs/community-standards/um_student_code_of_conduct_effective_8-1-2021.pdf
- Plagiarism occurs when a writer uses someone else's language, ideas, or other original (not common-knowledge) material without acknowledging its source. Please do not plagiarize.

Course Withdrawal Deadlines Statement <https://www.umt.edu/registrar/calendar/spring.php>

Important Dates Restricting Opportunities to Drop a Course Spring 2023 (please check registrar website):

To 7 th instructional day Jan 25 th	Students can add classes on Cyberbear without consent of instructor
To 15 th instructional day Feb 6 th	Students can drop classes on Cyberbear with partial refund, switch to CR/NCR, or change variable credit courses.
16 th to 45 th instructional day March 28 th	<p>Through Spring Class Day 45:</p> <p>Spring course adds & drops require instructor's & advisor's approval using the Course Add/Change/Drop link in CyberBear. \$10 fee applies per add or drop.</p> <p>A 'W' will appear on the transcript for dropped classes. No refunds.</p> <p>Students can change variable credit amounts and grading options (except audit) on eligible courses using the Course Add/Change/Drop link in CyberBear.</p>
Beginning 46 th instructional day	<p>After Spring Class Day 45:</p> <p>Adds require instructor's & advisor's approval using the Course Add/Change/Drop link. \$10 fee applies.</p> <p>Drops require instructor's, advisor's, & Dean's approval via Course Add/Change/Drop link. \$10 fee applies.</p> <p>A 'WP' or 'WF' will appear on the transcript for dropped classes. No refunds.</p> <p>Students can change variable credit amounts, or change grading options, (except audit) using the Course/Add/Change Drop link in CyberBear. .</p>