

FORESTRY 349 PRACTICE OF SILVICULTURE

Fall 2023

Instructor Information

Instructor: John Goodburn
Office: Rm. 201A Forestry Building Telephone: 406-370-7257 mobile/text
Email: john.goodburn@umontana.edu (best way to reach Instructor OR text/call when urgent)
Office hours: Mon & Tues 11:00am – 12:00pm or by appointment at good time for you.
Lecture and Discussion Mon. & Wed. 10:00 -10:50 a.m. FOR Rm 206
Lab/Field Work Thursday 2:00 - 5:50 p.m. Typically, in Field, but indoor FOR Rm 206.

(Field labs will meet to load vehicles outside the campus security office across street (east) from Griz Stadium)

Course Description

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. Silviculture can be thought of as applied forest ecology directed toward vegetation management objectives.

The FORS 349 - Practice of Silviculture course 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.

The course will consider forest dynamics at multiple scales, stand-level assessments of structure and composition, consideration of opportunities/constraints for meeting objectives, alternative silvicultural systems (single and multi-cohort), thinning/stand density concepts, various regeneration practices, and specific vegetative management strategies for diverse objectives. Students will evaluate opportunities and constraints for actual forest stands, inventory forest stands, develop management prescriptions, and employ modeling and quantitative assessment of alternative prescriptions. We'll discuss ecologically-based forest management strategies aimed at sustainable wood production, wildlife habitat enhancement, fire hazard reduction, watershed protection, and the maintenance of biological diversity, site productivity, & ecological site classification schemes.

Learning Objectives

Learning objectives for students completing the course will include the following:

Understanding of Ecological/Silvicultural Concepts.

Students should be able to:

- develop a clear understanding of key ecological concepts related to forest stand development and the response of forest vegetation to silvicultural practices;
- consider how different silvicultural practices might affect soil resources, forest health, wildlife habitat, biological diversity, wood production, water quality and yield, recreation, and aesthetics;
- and gain an appreciation for the social dimensions of silvicultural planning and need to adapt silvicultural practices to meet landowner objectives and landscape scale issues.

Technical expertise.

Students should be able to:

- diagnose and quantify current conditions in a stand given inventory information,
- utilize classification systems, quantitative guides, and economic analyses, other,
- correctly characterize key constraints and opportunities for silvicultural alternatives,
- model forest dynamics into future to evaluate alternative silvicultural options,
- describe desired conditions given landowner objectives,
- prescribe silvicultural treatments to will move current stand towards desired conditions.

Learning Objectives (cont.)

Effective communication of alternative silvicultural strategies.

Students should be able to:

- demonstrate a familiarity with silvicultural terminology,
- discuss practical application of regeneration techniques, intermediate treatments, and alternative silvicultural systems
- develop a silvicultural prescription to accomplish identified ownership objectives,
- propose alternative silvicultural treatment alternatives that might lead to desired conditions at the stand- and landscape-level.

Readings

Primary texts:

Silviculture and Ecology of Western U.S. Forests, 2nd ed. Tappeiner, Maguire, Harrington, & Bailey 2015.

Ecological Silviculture: Foundations and Applications. Palik, D'Amato, Franklin, and Johnson. 2020.

The Practice of Silviculture: Applied Forest Ecology, 10th edition. Ashton, M. and M. Kelty. 2018.

Additional background reading for this semester will draw upon other silviculture texts, along with additional journal articles or other materials. The objective is to provide readings electronically from selected chapters of these texts, journal articles, and other sources.

ALL Required Discussion Readings will be available via Moodle online, though you may want to pick up a copy of one of these texts for your own future use.

Equipment for Field Labs:

Many of you have acquired some personal field equipment in other classes that will be useful in the field, including your compass and diameter tape, but might also wish to acquire a vest, increment borer, other.

Grading System

Written assignments, Lab exercises (~Weekly)	50%
(Field Lab Write-ups, Silvicultural Prescriptions, Discussion Questions/Problem sets, Quizzes)	
Further info on assignments and weights will be provided on Moodle	
Midterm Performance	20%
Final exam	25%
Class participation	5%

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

Further information on assignments, due dates, etc. forthcoming.

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.

Labs

Thursday field labs will generally meet outside the Campus Security office (east of Griz Stadium) where we will board vehicles. Attendance at 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 for some reason**, and we can try to make alternative arrangement. If running late text or call me at my mobile phone (406-370-7257).

General Course Lecture Outline and Initial Reading Assignments

Tentative Lecture Schedule of Topics

Week/Date and Topic

- Week 1 (8/28)** Introduction: Silviculture in relation to forest management.
Readings: Nyland Chaps 1; Ashton & Kelty Chap 1; Nagel & O'hara (Stand);
- Week 2 (9/4)** No Class Monday - Labor Day Holiday (No Class)
Early Silviculture: Regeneration of Forests: Natural vs. Artificial Regen, Site Prep and other
Readings: TBA and available on Moodle
- Week 3 (9/11)** Ecological Basis for Silviculture and its Role in Forest Management
Stand Types, Silvicultural Objectives, and Silvicultural Systems
Readings: TBA and available on Moodle **QUIZ #1**
- Week 4 (9/18)** Growth of Forest Trees & Stands; Measures of Stand Density & Structure
Even-aged Silviculture
Readings: TBA and available on Moodle
- Week 5 (9/25)** Economic considerations for Silviculture
Readings: TBA and available on Moodle
- Week 6 (10/2)** Stand density concepts; Natural self-thinning;
PCT; Commercial Thinning Methods Application of thinning; Quantitative Assessment
Readings: TBA and available on Moodle **QUIZ #2**
- Week 7 (10/9)** **Multi-cohort** Seed-Tree & Shelterwood Systems, Regen under partial retention harvests
- Week 8 (10/16)** Monday- Midterm Review (Covering material through 10/13)
- Week 9 (10/23)** **Midterm Performance 1 Oct 19** To Be Determined – JG at SAF Natl Convention
Readings TBA
- Week 10 (10/30)** Developing Silvicultural Prescriptions to meet Multiple Objectives
Quantitative methods of managing Uneven-aged stands
Readings TBA **Field Lab Tentative Location – TBA**
- Week 11 (11/6)** Developing Silvicultural Prescriptions & Quantifying Effects – Wildlife and Fuels Reduction
Readings TBA **Field Lab Tentative Location – TBA**
- Week 12-14** Developing Silvicultural Prescriptions and Quantifying Effects
QUIZ #3 in Week 12
- Week 15 (12/4)** Review and Synthesis
- Finals Week Final Exam Performance (sched 8-10am, Tuesday Dec 12th)**

TENTATIVE FIELD LAB SCHEDULE (THURS 2:00pm-5:50pm)

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|-------------|---|
| Wk 1 Aug 31 | No Lab Meeting week 1 |
| Wk 2 Sept 7 | Field Lab – Lubrecht Regeneration Surveys, stocking, planting plans |

Wk 3 Sept 14	Field Lab – QUIZ and Indoor Lab
Wk 4 Sept 21	Field Lab – Natural Regeneration, Stand delineation, Stand inventory
Wk 5 Sept 28	Field Lab – Thinning, Levels of Growing Stock Analysis (Coyote Larch)
Wk 6 Oct 5	Field Lab – TBA
Wk 7 Oct 12	Indoor Lab
Wk 8 - week 13	Field Labs plans under development (to be announced) Missoula County

Extended Field trip (Rather than Thurs) tentatively being planned for Fri-Sat 11/3-11/4 pending host availability and time conflicts. Alt dates in mid October (10/20).

Labs are scheduled for a four-hour block for efficiency in travel and field work logistics.

**** Unless lab is scheduled to be indoors, always wear appropriate field clothes** and closed-toe shoes to labs. If rain is forecast, bring rain gear and do not expect lab to be canceled on account of bad weather.

***** Please be on time for lab.** We will often have a bit of travel to get to field sites (e.g., Lubrecht Experimental Forest) and the vehicles may not be able to wait for you. *******

Special Accommodations

Students with disabilities who need accommodations should see me privately after class or during my office hours to request reasonable modifications.

The University of Montana assures equal access to instruction for students with disabilities in collaboration with instructors and consult the Office of Disability Equity, which is located in Aber Hall. The University does not permit fundamental alterations of academic standards or retroactive modifications.. For more information, please consult the Office of Disability Equity (ODE)- <https://www.umt.edu/disability/>

UM Course Policies:

Students at the University of Montana have the responsibility to conduct themselves in a way that positively impacts the safety, welfare, or educational opportunities of others in the University community. Students are expected to act as responsible members of the community, respect the rights, privileges, and dignity of others, and refrain from actions that infringe upon the rights of others or interfere with normal University activities.

- 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 Student Conduct Code. <https://www.umt.edu/student-affairs/community-standards/default.php>
- **CLASS REGISTRATION, ADDS, DROPS, CHANGES, ETC.**

Autumn Semester 2023: <https://www.umt.edu/registrar/calendar/autumn.php>

Important UM deadlines for changing course options:

Date	Description
To 15 th instructional day (Sept 18 th 5pm)	Autumn class day 15: Last day to drop individual classes on CyberBear with no W on transcript; refunds where applicable. Last day to withdraw from the semester (drop all courses) with a partial refund. See semester withdrawal website for details and withdrawal form. Last day to add classes with digital registration override on CyberBear. Last day to change credits in variable credit courses & switch grade mode in CyberBear without instructor's consent. Tuition and fees are billed as usual for additional credits or newly added courses. Last day to change grading option to or from audit. Last day to buy or refuse UM's student health insurance coverage.
16 th to 45 th instructional day Sept. 19–Oct. 30, 2023 (5 p.m.)	Autumn class day 16 - 45: Course adds & drops require instructor's & advisor's approval using the Course

Date	Description
	<p>Add/Change/Drop link in CyberBear. \$20 fee applies per add or drop. A W will appear on the transcript for dropped classes. No refunds for course drops or withdrawals. Students can change variable credit amounts and grading options (except audit) on eligible courses using the Course Add/Change/Drop link in CyberBear. Tuition and fees are billed as usual for additional credits or newly added courses.</p>
<p>Beginning 46th instructional day Oct 31- Dec 8, 2023</p>	<p>Autumn class day 46 - last class day:</p> <p>Course adds require instructor's and advisor's approval using the Course Add/Change/Drop link. \$20 fee applies. Drops require instructor's, advisor's, and Dean's approval via Course Add/Change/Drop link. \$20 fee applies. A WP or WF will appear on the transcript for dropped classes. No refunds for course drops or withdrawals. Students can change variable credit amounts, or change grading options, (except audit) using the Course Add Change Drop link in Cyberbear. Tuition and fees are billed as usual for additional credits or newly added courses.</p>