Course Description

The Multiple Resource Silviculture course introduces the concepts behind various silvicultural techniques and their application in forest ecosystems to meet multiple resource objectives. This course integrates the biological principles of tree growth and regeneration (silvics) with the application of this knowledge to the management of forest stands (silviculture). The study of Silvics considers the biological life histories and environmental requirements of forest trees. It includes such topics as soil and site requirements, pattern and rates of growth, competition, seed production and dissemination, and reproductive strategies. Silviculture is 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.

The subject matter of the course will include coverage of silvics, forest dynamics, intermediate stand treatments, reforestation principles, even-aged and uneven-aged silvicultural systems, and ecological restoration techniques. We will discuss ecologically-based forest management strategies aimed at sustainable wood production, wildlife habitat enhancement, watershed protection, and the maintenance of biological diversity, site productivity, and aesthetic quality.

Performance goals for students completing the Multiple Resource Silviculture course will include the following:

- Students should have a clear understanding of key ecological concepts related to forest stand development and the response of forest vegetation to silvicultural practices.
- Students should be familiar with the key silvical characteristics of the common tree species in the northern Rockies.
- Students should demonstrate a familiarity with silvicultural terminology and be able to discuss practical application of regeneration techniques, intermediate stand treatments, and alternative silvicultural systems.
- Students should be able to diagnose and quantify current conditions in a stand given inventory information, to describe desired conditions given landowner objectives, and to prescribe silvicultural treatments that will move current stand towards desired conditions.
- Students should be able to consider how different silvicultural practices might affect soil resources, forest health, wildlife habitat, biological diversity, wood production, water quality and yield, recreation, and aesthetics.
- Students should also gain an appreciation for the social dimensions of silvicultural planning and need to adapt silvicultural practices to meet landowner objectives and landscape scale issues.

Readings
Two background texts: This semester we will reference two different textbooks (that you should not have to buy) that cover much of the same material, without major disagreement on terminology, methodology etc. Both are available on-line or in the book store, listed as optional/recommended for the class. Suggested background reading assignments associated with various topics covered during the semester will be listed in the course schedule. Both books will also be on traditional reserves at the Mansfield Library for your use if you are unable to purchase either text.


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.

Upper Division Writing
This course is one of three courses needed to satisfy the upper division writing requirement for CFC majors. Each student is required to achieve satisfactory scores on a sophomore-level writing course (FOR 220/WBIO 245 or equivalent). The successful completion of one of these courses plus the writing proficiency exam will be prerequisites for completion of the upper division distributed writing requirement.

Assessment of student writing will be on the basis of the following criteria:
1. A clear statement of purpose (hypothesis or question or goal) within the scientific context of the specific discipline.
2. The development of effective logical arguments using evidence and/or theory from the discipline or supporting disciplines.
3. Writing meets discipline-specific writing conventions including the proper citation of sources of information.
4. Demonstrate appropriate English language usage.

Labs
Wednesday and Thursday field labs will generally meet at outside the Campus Security office (east of Griz Stadium) where we will board vans. Indoor lab periods will meet in the Forestry Building (Wed in Rm 106 & Th Rm 206). 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. Labs are scheduled for a four hour block for efficiency in travel and field work logistics. The trade-off is that lab will meet only about ¾ of the weeks (in order to approximate a 3 hour lab).

** 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 vans may not be able to wait for you. ***

Drop in or drop me a line
You are encouraged to ask questions and initiate discussions both in and out of class. I am 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!

Grading System

Lab assignments, Written exercises - 48%
Field Lab Write-ups, Silvicultural Prescriptions, Problem set, Quizzes (?), Other

Midterm Performance I  -  14%
Midterm Performance II  -  16%
Class participation  -  2%
Final exam  -  20%

Special Accommodations
Students with disabilities who need accommodations should see me privately during my office hours to make arrangements.

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**FORESTRY 347**
**MULTIPLE RESOURCE SILVICULTURE**
*Autumn 2008*

**Tentative Course Outline and Reading Assignments***

<table>
<thead>
<tr>
<th>Lecture/Lab Schedule</th>
<th>Topic</th>
<th>Associated Reading in Text</th>
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<tbody>
<tr>
<td><strong>Date</strong></td>
<td><strong>Week 1</strong></td>
<td><strong>Introduction,</strong></td>
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<tr>
<td>8/25 M</td>
<td><strong>Purpose of Silviculture</strong></td>
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<tr>
<td>8/27 W</td>
<td><strong>W or H Lab</strong></td>
<td><strong>No Lab</strong></td>
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<tr>
<td><strong>Week 2</strong></td>
<td><strong>No Class – Labor Day Holiday</strong></td>
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<tr>
<td>9/1 M</td>
<td><strong>Forest stand dynamics,</strong> <strong>Stages of stand development</strong></td>
<td><strong>Smith Chap. 2</strong></td>
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<tr>
<td>9/3 W</td>
<td><strong>Ecological Site Classification; Site Index,</strong> <strong>Forest Habitat Typing</strong></td>
<td><strong>Smith Chap. 9, pp 235-252</strong></td>
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<tr>
<td>W or H Lab</td>
<td><strong>Planning for Regeneration,</strong> <strong>Site classification,</strong> <strong>Evaluating stocking levels</strong> (Blue Mtn)</td>
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<tr>
<td><strong>Week 3</strong></td>
<td><strong>Forest stand dynamics,</strong> <strong>Interpreting stand structure and history</strong></td>
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<tr>
<td>9/8 M</td>
<td><strong>Ecological Site Classification; Site Index,</strong> <strong>Forest Habitat Typing</strong></td>
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<tr>
<td>9/10 W</td>
<td><strong>Planning for Regeneration,</strong> <strong>Site classification,</strong> <strong>Evaluating stocking levels</strong> (Blue Mtn)</td>
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<tr>
<td>W or H Lab</td>
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<td><strong>Week 4</strong></td>
<td><strong>Regeneration Strategies</strong></td>
<td><strong>Nyland Chap 4</strong></td>
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<tr>
<td>9/15 M</td>
<td><strong>Regeneration Strategies (cont)</strong> <strong>Natural vs. Artificial Regen</strong></td>
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<tr>
<td>9/17 W</td>
<td><strong>W or H Lab</strong></td>
<td><strong>Silvicultural Systems and Regeneration</strong> (Lolo NF, Elk Meadows Rd)</td>
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<tr>
<td><strong>Week 5</strong></td>
<td><strong>Nursery production of planting stock &amp; tree planting</strong></td>
<td><strong>Smith Chap. 10, pp 264-286</strong></td>
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<tr>
<td>9/22 M</td>
<td><strong>Site preparation</strong></td>
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<tr>
<td>9/24 W</td>
<td><strong>W or H Lab</strong></td>
<td><strong>Silvicultural Inventory; Stand Assessment/Diagnosis – (Rattlesnake NRA)</strong></td>
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<tr>
<td><strong>Week 6</strong></td>
<td><strong>Stand density concepts; Natural self-thinning</strong></td>
<td><strong>Chap. 3 pp 47-60. &amp; Chap. 4</strong></td>
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<tr>
<td>9/29 M</td>
<td><strong>Pre-commercial thinning; Release and Improvement cuts</strong></td>
<td><strong>Chap. 6, p. 131-133, 147-156</strong></td>
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<tr>
<td>10/1 W</td>
<td><strong>W or H Lab</strong></td>
<td><strong>Mark thinning using stocking guides and crop tree release method – (Lubrecht Exp. Forest)</strong></td>
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Week 7
10/6  M  Midterm Performance I  (Covering material through 10/1)
10/8  W  Application of thinning; Commercial thinning methods  Chap. 5
W or H Lab  Lab TBA

Week 8
10/13  M  Thinning frequency and intensity; Quantitative Assessment tools
10/15  W  Thinning for Fuel hazard reduction  ERES
W or H Lab  Fire & Thinning as tools of restoration ecology; Ponderosa Pine  (Ninemile RD, Lolo NF)

Week 9
10/20  M  Silvicultural systems - Even-aged methods Revisited  Chap. 11, 12
10/22  W  Partial Retention Harvests for Various Objectives (Regen, Wildlife, Aesthetics)
W or H Lab  Seed-Tree & SW Systems, Regen under Partial Retention Harvests – (Roman Creek)

Week 10
10/27  M  Introduction to Single-tree and group selection  Chap. 15
10/29  W  Quantitative methods of managing Uneven-aged stands  Chap. 16
W or H  NO LAB

Week 11
11/3  M  Uneven-aged Mgmt in Ponderosa Pine  ERES
11/5  W  Midterm Performance II  (Covering material through 10/29)
W or H Lab  NO LAB

Week 12
11/10  M  Silvicultural control of damaging agents  Chap. 19
11/12  W  Silvicultural control of damaging agents (cont)
W or H Lab  Managing Uneven-aged stands; Silvicultural Prescriptions  (Lubrecht)

Week 13
11/17  M  Silvicultural techniques for maintaining biological diversity  Chap. 20
11/19  W  No Class - Thanksgiving vacation
W or H Lab  No Lab - Thanksgiving vacation

Week 14
11/24  M  Developing Silvicultural Prescriptions
11/26  W  Silvicultural strategies for specific Wildlife Habitat
W or H Lab  Work on Silvicultural Prescriptions

Week 15
12/1  M  Additional Topics
12/3  W  Review and Synthesis Lecture
W or H Lab  Review and questions?

Finals Week
  Final Exam Performance

* Course outline and reading assignments may be subject to minor changes as necessary.