

The Practice of Silviculture: Applied Forest Ecology

Lecture: Lab:
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Instructor:

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Course Website:

TBA

Office hours:

To be arranged

Readings:

Required

1. Smith, D.M., B.C. Larson, M.J. Kelty, and P.M.S. Ashton. 1997. *The Practice of Silviculture: Applied Forest Ecology* (9th ed.). Wiley. 537 p.
2. Burns, R.M. and B.H. Honkala. 1990. *Silvics of North America*, Vols. I and 2. USDA Forest Service, Agricultural Handbook 654. Available online at:
http://www.na.fs.fed.us/spfo/pubs/silvics_manual/table_of_contents.htm
3. Glossary of Forestry Terms
4. Handouts throughout the semester (check the course website).

Suggested

1. Husch, B., T.W. Beers, and J.A. Kershaw, Jr. 2003. *Forest Mensuration* (4th ed.). John Wiley & Sons. 443 p.
2. Oliver, C.D. and B.D. Larson. 1996. *Forest Stand Dynamics* (Updated Edition). John Wiley & Sons, 520 p.
3. Nyland, R. 2001. *Silviculture: Concepts and Applications*. (2nd ed.). McGraw Hill 682 p.

Course Description:

Silviculture, derived from the Latin words *silva*, meaning forest, and *culture*, meaning cultivation, **is the art, science, theory and practice of controlling the establishment, composition, growth, quality and health of forest stands to meet the objectives of management**. The management objective may be commodity, aesthetic, environmental, a combination thereof, or something else altogether. Through interventions like planting, thinning, harvesting, prescribed fire, etc., silviculturists change the condition and development patterns of forest stands to meet ownership objectives.

In a sense the practice of silviculture is similar to that of farming, though farming implies an intensity of practice which is seldom appropriate in forestry. The silviculturist deals with the “natural” environment. In comparison to modern agriculture the silviculturist exerts very limited control over the ecological factors of that environment. As a consequence, the silviculturist must have a comprehensive understanding of the role that each of the ecological factors plays in the forest since objectives are accomplished primarily through limited, but timely, interventions in a natural process.

To understand the role as manipulator of nature, a competent silviculturist must be thoroughly grounded in the physical and biological sciences upon which silvicultural practice rests. The silviculturist must also be an expert in analyzing the dynamics of each forest stand being managed and be capable of developing from this analysis an appropriate sequence of treatments which will best and most economically mold that stand into a functioning ecosystem capable of satisfying the particular management objectives which have been established.

By the end of this course, students should be able to a) demonstrate an understanding of silviculture terms and concepts; b) obtain, summarize, and analyze primary information; c) understand stand management plans; and d) communicate about each of these effectively.

To achieve these goals, students should already have a strong background in the fundamental sciences. This course is designed, therefore, to help each person achieve the following goals:

- 1) Learn the technical methodology of silvicultural practice
- 2) Develop an understanding of how ecological concepts and principles relate to the manipulation of forest stands in silvicultural practice
- 3) Gain an overview of the procedures used to analyze and describe forest ecosystems in order to meet forest management objectives
- 4) Gain insight and experience in the prescription of silvicultural practices for the accomplishment of varied management objectives
- 5) Gain field experience in selected silvicultural practices
- 6) Develop an ability to effectively communicate silvicultural concepts, theories, and applications using correct technical terminology
- 7) Become an effective steward of our natural resources

Policies for the conduct of the course:

Classroom and Lab Format

The classroom sessions will generally focus on a weekly topic with the first class meeting to focus on introductory material via lecture and clarification of reading assignment. The second class meeting will be devoted to discussion, review of current research and the occasional outside speaker. Laboratories will vary from hands-on experience, to reviewing active silvicultural operations and related demonstrations.

Attendance

Attendance is mandatory, and each student is held responsible for all material presented in class. The only excused absences will be notification beforehand with a good reason for missing the class (e-mail is fine). Arrangements should be made with a classmate to take notes and obtain copies of handouts when absence is unavoidable. Lectures are to emphasize important topics, answer questions, and provide information from recent research. It will be the absentee's responsibility to initiate action with the instructor to make up missed work.

Participation during lab sessions and when prompted during lecture is necessary to excel in this course. A percentage of your final grade will come from how the instructor perceived you participated throughout the course.

Assignments

When assignments are due, they are to be submitted in the manner required (usually by email). Late submissions will be docked 25% of the total value for the assignment each day until it is submitted. Assignments submitted more than four days late will not be assessed. Assignments should be typed and of professional quality.

Quizzes, Tests, and Exam

Students will be tested on material drawn from lectures, assigned readings, laboratory sessions, and assignments. All quizzes, tests, and exams will be closed-book. Unannounced quizzes will be conducted throughout the semester, testing on important recent concepts. There will be two tests during the semester which will include any material covered to the date of the test. A comprehensive final exam will be given at the end of the semester during finals week.

Grading Procedure: TBA

Tentative topics schedule:

Week 1 Course overview, introduction to silviculture; Self-assessment test; Dendrology and silvics overview; Tree Physiology overview

Week 2 Applied mensuration for silviculture; Stand definition and delineation

Week 3 Tree growth, stand structure and development

Week 4 Natural regeneration

Week 5 Artificial regeneration

Week 6 Stand Dynamics

Week 7 Intermediate Treatments

Week 8 & 9 Even-aged/sized management

Week 10 & 11 Uneven-aged/sized management

Week 12 Best Management Practices

Week 13 Innovations, machines, new paradigms

Week 14 Silviculture and forest restoration

Week 15 Hot topics in silviculture – certification, sustainable forestry, invasives, etc.

Tentative list of labs

Silviculture data vs Forest Management Data

Tree and Stand Growth/Stem Analysis

Silviculture Inventory

Stand Analysis

Tree, Log and Lumber Grading/Wood Mizer Demo

Timber Harvesting Site Visit

Tree Nursery and Tree Improvement Site Visit

Tree Planting Operation

Sawmill/veneer mill tour

Intermediate Treatments

Regeneration Harvests

Forest Wildlife

Forestry BMP analysis