F&WE 410 PRINCIPLES OF SILVICULTURE, Spring 2015

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Catalog description: Ecologically-based forest management principles for sustainable timber production, maintenance or restoration of biological diversity, and maintenance of aesthetic quality and site productivity. Includes coverage of even-aged and uneven-aged management, reforestationprinciples, and ecological restoration techniques.
(Prereq.: Introductory course in ecology and junior standing, or consent of instr.).

This course integrates the biological life history and environmental requirements of trees with Principles and practices employed to apply this knowledge to the management of forest stands.

Learning objectives:
(1) to gain a basic understanding of how forests develop and regenerate in response to natural processes and natural disturbances;
(2) to learn how forests and landscapes can be managed to meet wood and fiber needs of society while maintaining long-term productivity, forest health, biodiversity, and aesthetics;
(3) to learn how forests degraded from past exploitation or under current environmental stresses can be restored to maintain health and productivity;
(4) for lab students, to gain hands-on experience in designing and implementing silvicultural prescriptions .

Format: Three 50-minute lectures/week (3 credits). A lab (1 credit) is restricted to Forest Science majors, unless participation and registration for this fourth credit is authorized by Prof. Stanosz.

Grading:

LECTURE EXAMS (closed book): Exam 1, 30 points; Exam 2, 30 points)

QUIZZES: 20 points

HOMEWORK ASSIGNMENTS (and lab exercises for student enrolled in lab): 20 points (due at start of class on dates indicated when assigned, deduction if late)

Grades are assigned using the scale below that is at the Registar's site, for points as detailed above. A (Excellent), AB (Intermediate Grade), B (Good), BC (Intermediate Grade), C (Fair), D (Poor), and F (Failure). UW-Madison has no official, rigid point system for assignment of these grades. Although the following scale for point totals is used as a guide, students whose point totals are within a one tenth or a few tenths of each other are generally not assigned different grades.

A 93-100, AB 88-92.9, B 82-87.9, BC 78-81.9, C 70-77.9, D 60-69.9, F Below 60

Graduate students are assessed separately from undergraduate students. In addition to work above, graduate students are evaluated on contributions to discussions and laboratory.

Use of cellular telephones is prohibited. Except for capture of images as described below, cell phones may not be used at any time. Turn cell phones off and put away prior to the start of these class meetings. See Prof. Stanosz for exceptions related to family emergencies.

Use of computers or other devices for audio or video recording or taking notes during any lectures, laboratories, or field trips is prohibited, except to capture still images during laboratories or on field trips. Professor Stanosz will consider requests for exceptions in cases of disability. Please note that electronic capture of an image and typing do not provide the same learning opportunity as the process of taking handwritten notes, which is strongly recommended.

Required and recommended readings

A **bound packet of the required readings may be purchased** at Bob's Copy Shop (Pigwick Papers), 208 N. Charter St. (Corner of Charter & Dayton). Students should read required material **prior to** the start of the lecture period at which they appear on the lecture schedule.

Additional required readings may be distributed or made available through Learn@UW as the semester progresses.

The following three books are also **useful recommended references** and have been requested to be placed on reserve at Steenbock Library:

Nyland, R. D. 2002. Silviculture: Concepts and Applications. 2nd edition. McGraw-Hill.
(Probably the best overall text on silviculture, covering both the underlying biological principles and practical field implementation.)

Burns, R. M. and B. H.. Honkala. 1990. Silvics of North America. USDA Handbook 654.
(Not a textbook, but an excellent two volume encyclopedic reference on silvics of the major commercial species.)

USDA. 1983. Silvicultural Systems for Major Forest Types of the United States. Handbook 445.
(A reference book on silvicultural systems for specific forest types.)

The following two books are **recommended "background reading"** and might be particularly value for students who are not Forest Science majors.

Avery and Burkhardt. 2002. Forest measurements, 5th ed.
(chapters on: tree and stand volumes; site, stocking, and growth)

Young, R. A. and Giese, R. L. 2003. Introduction to forest ecosystem science and management 3rd ed.
(chapter on silviculture, glossary of forest terms)

F&WE 410 Introduction to Silviculture, Spring 2015 Schedule (subject to modification)

Week	Day	Lecture	Required readings
1	**Wed 21 Jan**	**I. Intro + course objectives**	
	Fri 23 Jan	**II. Ecol basis** **A** forest types	
2	**Mon 26 Jan**	**II. Ecol basis** **A** forest types	
	Wed 28 Jan **LAB**	**II. Ecol basis** **B** site index	**Kotar & Burger** **Cleland et al.**
	Fri 30 Jan	**II. Ecol basis** **C** habitat type	
3	**Mon 2 Feb**	**III. Tree growth and natural stand development** **A** Tree growth, form, wood prodn , effects of silvicultural trts	
	Wed 4 Feb **LAB**	**III. Tree growth and natural stand development** **A** continued **B** shade tolerance	
	Fri 6 Feb	**III. Tree growth and natural stand development** **C** natural precedents: EA, UEA, mixed species stands	
4	**Mon 9 Feb**	**III. Tree growth and natural stand development** **C** natural precedents: EA, UEA, mixed species stands	
	Wed 11 Feb **LAB**	**IV. Interm stand trts** **A** precomm thinning, highgrading	**Clatterbuck** **Hovind &Hovind**
	Fri 13 Feb	**IV. Interm stand trts** **B** release + imprvmt cuts, restoring degraded stands	
5	**Mon 16 Feb**	**IV. Interm stand trts** **B** release + imprvmt cuts, restoring degraded stands	**Kilgore et al.**
	Wed 18 Feb **LAB**	**IV. Interm stand trts** herbicides	**Mater et al.** **Smith et al.**
	Fri 20 Feb	**IV. Interm stand trts** **C** herbicides	
6	**Mon 23 Feb**	**IV. Interm stand trts** **D** comm thinning	**Lamson et al.**
	Wed 25 Feb **LAB**	**IV. Interm stand trts** **D** comm thinning	**Zeide** **Kimbell et al.**
	Fri 27 Feb	**IV. Interm stand trts** **E** thinning freq and intensity	
7	**Mon 2 Mar**	**IV. Interm stand trts** **F** thinning for OG character	**Mazza** **Teraoka & Keyes**
	Wed 4 Mar **LAB**	**IV. Interm stand trts** **G** fertilization	
	Fri 6 Mar	**TEST I. – V.**	
8	**Mon 9 Mar**	**V. Devel + refinement of silvicultural systems** **A** overview **B** evolution of silvic systems, ecosystem mgmt	**DellaSala et al., Frankin & Johnson, Henson et al.** **Rapaille, Curtis**
	Wed 11 Mar **LAB**	**VI. Mgmt and regen mature forest stands** **A** natural vs. artificial **B** seed prod/dispersal **C** seed trt	
	Fri 13 Mar	**VI. Mgmt and regen mature forest stands** **D** silvic systems EA, two age methods **1** cc	**Strothman &Roy**

9	**Mon 16 Mar**	**VI. Mgmt and regen of mature forest stands** **D** silvic systems EA, two age methods **1** cc continued, **2** seed tree	
	Wed 18 Mar **LAB**	**VI. Mgmt and regen of mature forest stands** **D** silvic systems EA, two age methods **1** shelterwood	**Burger and Keyser** **Miller et al.**
	Fri 20 Mar	**VI. Mgmt and regen of mature forest stands** **D** silvic systems EA, two age methods **1** shelterwood continued, **2** two age	
10	**Mon 23 Mar**	**VI. Mgmt and regen of mature forest stands** **E** silvic systems UEA, multiage methods **1** single tree selection	**Roach**
	Wed 25 Mar **LAB**	**VI. Mgmt and regen of mature forest stands** **E** silvic systems UEA, multiage methods **1** single tree selection	
	Fri 27 Mar	**VI. Mgmt and regen of mature forest stands** **E** silvic systems UEA, multiage **methods** **1** single tree selection	
11	**Mon-Fri Mar 30-Apr 3**	**Spring Break**	
12	**Mon 6 Apr**	**VI. Mgmt and regen of mature forest stands** **E** silvic systems UEA, multiage methods **2** group selection	**Schaffer et al.**
	Wed 8 Apr **LAB**	**VI.Mgmt and regen of mature forest stands** **E** silvic systems UEA, multiage methods **3** uneven age conversion	**O'Hara**
	Fri 10 Apr	**VI. Mgmt and regen of mature forest stands** **E** silvic systems UEA, multiage methods **4** multicohort mgmt	
13	**Mon 13 Apr**	**VII. Genetic tree impvmt, artif regen, economic comparison** **A** genetics **B** provenances **C** site prep and planting	**Adams et al.** **Haddon** **Nyland, Chpt. 7** **Watts**
	Wed 15 Apr **LAB**	**VII. Genetic tree impvmt, artif regen, economic comparison** **C** cont. site prep and planting **D** EA vs UEA productivity/econ comparison	
	Fri 17 Apr	**VIII. Environmental effects** **A** erosion & water quality **B** nutr budget & site productivity **C** plants & animals	**Thompson 2008**
14	**Mon 20 Apr**	**IX. Mgmt for site, wldlf, aesth, biodiversity** **A** restoring degraded areas	**Hunter** **Thompson 2007** **Duncan** **Calhoun**
	Wed 22 Apr **LAB**	**IX. Mgmt for site, wldlf, aesth, biodiversity** **B** maintaining biol diversity	
	Fri 24 Apr	**IX. Mgmt for site, wldlf, aesth, biodiversity** **C** mgmt for rare/declining spp	
15	**Mon 27 Apr**	**IX. Mgmt for site, wldlf, aesth, biodi** **D** biodiversity and forest mgmt at landscape scale	
	Wed 29 Apr **LAB**	**IX. Mgmt for site, wldlf, aesth, biodi** **E** emulating natural disturb **F** forest certification **G** mgmt for aesthetics	**Seymour et al.** **Schuh** **Brunson &Shelby**
	Fri 1 May		
16	**Mon 4 May**	**X. Regional issues** **A** white pine **B** conifer plantations **C** aspen **D** no. hdwd diversity/quality **E** hemlock **F** oak regen	
	Wed 6 May **LAB**		
	Fri 8 May		