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SEP 10 2002

Grande Prairie Regional College
Department of Science & Technology
Bachelor of Applied Forest Resource Management
Course Outline
Fall 2001

Course: *Silviculture* (FO 3130) 3(3-0-3)
Classroom: B201
Lab: B304

Instructor: Weixing Tan, PhD
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Transfer Status: Athabasca University SCIE 2xx; Augustana University College BIO 3xx

Prerequisites: FO 2020 (Forest Ecology)

Time of Lectures: Tuesday and Thursday 10:00 - 11:20
Time of Lab: Thursday 14:30 - 17:20

Calendar Description

Review of physiological and ecological principles for regeneration. introduction to silviculture (harvesting) systems for regeneration, pre- and post-harvest ecological assessments, forest regeneration principles and techniques, silvics and species selection, container and bareroot nursery practices, policies, regulations and current practice, enhanced forest management, including tree improvement and stand tending (thinning, fertilization, pruning and drainage).

Textbook

Smith DM et al. 1997. **The Practice of Silviculture: Applied Forest Ecology**. John Wiley & Sons.

Major References

- 1) Wagner RG and Colombo SJ. 2001. **Regenerating the Canadian Forest – Principles and Practice for Ontario**. Fitzhenry & Whiteside Ltd. and Ontario Ministry of Natural Resources.
- 2) Lavender DP et al. 1995. **Regenerating British Columbia's Forests**. UBC Press.
- 3) Alberta Environmental Protection. 1996. **Forest site interpretation and silvicultural prescription guide for Alberta**. Alberta Environmental Protection.
- 4) Alberta Environmental Protection. 1996. **Pre-harvest ecological assessment handbook**. Alberta Environmental Protection.
- 5) (Various authors). **Field Guide to Ecosites of Alberta**. UBC Press. (series of 4 publications)
- 6) Nyland RD. 1996. **Silviculture: Concepts and Applications**. McGraw-Hill
- 7) Zobel B. and Talbert L. 1986. **Applied Forest Tree Improvement**. Wiley.
- 8) Burns, R.M. and Honkala, B.H. 1990. **Silvics of North America** (Vol. I and II) Agriculture Handbook 654, USDA Forest Serv., Washington, D.C. (reserved in the library)

Scientific Journals and Periodicals (available in the Library)

Canadian Journal of Forest Research, Forestry Chronicle, Northern Journal of Applied Forestry,
Canadian Silviculture Magazine

Useful Web Sites

www.for.gov.ca, www.canadian-forests.com, www.fs.fed.us, www.forestnet.com, www.foresters.org,
www.forestindustry.com,

Course Content

Major topics to be addressed in this course and suggested readings from the recommended texts are outlined below:

Topic	Week	Readings (chapters)	
		Smith 1997	Lavender et al. 1995
Introduction – definition, purposes, the role of silviculture in forestry, philosophy, scope and terminology	Week 1	1	1
Review of physiological & ecological principles for regeneration - climate, light, temperature, moisture, soil, wind, elevation, microsite concept			1 to 6
Stand structure and dynamics - crown classes, stand structure, age and age class, origin, site index, stand initiation, exclusion, understory reinitiation, and old growth, multiple resources	Week 2	2	5 & 6
Silviculture Planning - in relation to overall management plan, policies and regulations, short- and long-term, economic, social and environmental considerations			7
Pre-, mid- & post-harvest assessments & ecosite classification in Alberta, site limitations/opportunities	Week 3 & 4	part of 9	8
Harvesting as a tool of silviculture (to harvest or not?)		References will be provided	
Introduction to silviculture systems & selection of regeneration methods - clearcutting, shelterwood, seed tree, selection (single tree or group trees), mixedwood stands and management, natural versus artificial regenerations	Week 5 & 6	7 & 11	8 and 10

Site preparation - microsites and microclimates, site preparation techniques (mechanical and manual, fire, and chemical), site constraints and selection of site preparation techniques.	Week 7 & 8	8	11, 12 & 13-4
Species selection and silvics	Week 9	9	6 & 14
Seedling production - seed production, seed dormancy, cone and seed collection, seed storage and stratification, production of container stocks, production of bareroot stocks, seedling handling, transportation and storage.	Week 10	10	16 & 17
Planting & regeneration surveys - stock type selection and primary site stresses, assessment of seedling quality (material and performance attributes), timing of planting, field operation, planting quality checks, regen monitoring and surveys (establishment and performance or free-to-grow).	Week 11	10	18
Vegetation competition and control - interspecific competition and indices, autecology of competitive species and interaction with crops, control alternatives (clipping, brushsaw, girdling, grazing, herbicides, effectiveness, environmental risks, human health risks, costs), injury to crops, herbicide application (ground broadcast, basal bark, stem injection, aerial).	Week 12	6	19
Enhanced forest management - stand tending: Intraspecific competition and self-thinning rule ($\approx 3/2$ power law), pre-commercial and commercial thinnings, low, crown and selection thinnings, long-term returns of thinning, pruning, release cuttings. - genetic tree improvement - fertilization and drainage - Overview	Week 13 Week 14 Week 15	3, 4 and 5 (Extra reference materials will be provided)	14

Requirements

Regular attendance at lectures and participation in classroom discussion is required. Presence at each laboratory is compulsory for this course. A passing grade in the lab is required to pass the course. A medical note from your Doctor(s) is required for all excused absences. Marks will be deducted on overdue lab report(s) at a rate of 10% per day.

Evaluation

Quizzes/Assignments	15%
Lab Reports	20%
Midterm Exam	25%
Final Exam	40%
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	100%

S - POINT GRADE	PERCENTAGE EQUIVALENT	DESIGNATION
9	90 - 100	EXCELLENT
8	80 - 89	
7	72 - 79	
6	65 - 71	GOOD
5	57 - 64	PASS FAIL
4	50 - 56	
3	45 - 49	
2	36 - 44	
1	0 - 25	

Laboratory Schedule

Week	Date	LAB #	DESCRIPTION
1	06/09	1	Introduction
2	13/09	2	Pre-harvest assessment (PHA)
3	20/09		
4	27/09	3	Planting and regen surveys and stand tending
5	04/10		
6	11/10	4	Site preparations and equipment
7	18/10	5	Vegetation management
8	25/10	No lab	Midterm exam week
9	01/11	6	Tree improvement
10	08/11	7	Seedling production
11	15/11	8	Silvics of major trees in Canada
12	22/11		
13	29/11	9	Presentation of Lab 7
14	06/12	10	Development of silvicultural prescription based on Lab 2
15	13/12	11	Open session

Detailed lab instructions will be distributed before each lab. Please bring a **calculator**, pencils, eraser, some paper, and binder to hold data sheets at each lab.