



**COLLEGE OF NEW CALEDONIA**  
**Division of Business and Technology**

**Forest Resource Technology**

**FOR 254**  
**Silviculture II**

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Prepared by : Ed Morrice, RPF	Original by : Ed Morrice
Date : Jan.09	Credit : 5
Term : Spring	Lecture Hrs : 4
Revised : Dec.08	Lab Hrs : 2
Prerequisite : FOR 253	Co-requisite : FOR 252, 286, 288
Instructor : Ed Morrice, RPF	Office Hours : Posted
Lecture : TBA	Office : 3-228
Lab : TBA	Phone : 562-2131 Loc 5215
	E-Mail : <a href="mailto:morrice@cnc.bc.ca">morrice@cnc.bc.ca</a>

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**CALENDAR DESCRIPTION:** Continuing with the aim to develop strategies for forest regeneration success, this course starts with studies on methods of establishment, seed collection, tree improvement practices, nursery practices and seedling quality assessment. Studies move on to vegetation management and stand tending to ensure successful establishment. If time allows, techniques used to improve timber yield and value will be studied, including pruning, pre commercial and commercial thinning. Participants are expected to synthesize course material at the stand level with the preparation of a silviculture prescription within the context of a landscape level plan. Participants are expected to apply silviculture operations within the context of public, environmental and economic concerns.

**COURSE GOAL:**

To complete the study of basic silviculture techniques and to apply knowledge developed in forest ecology, silvics and soils within the framework of silviculture recommendations. Introduce incremental silviculture activities with an emphasis on juvenile spacing.

## **LEARNING OBJECTIVES:**

Upon successful completion of this course, the student should be able to:

### **1. Site Preparation**

- a. Identify site limiting factors affecting early survival and growth of plantations
- b. Recommend an appropriate amelioration of site limiting factors by mechanical, chemical or burning
- c. Explore the core requirements for preparing and implementing a prescribed burning plan. Utilize burn planning tools based on fire behaviour prediction.
- d. Be familiar with monitoring techniques utilized for assessment of site preparation

### **2. Seed and Seedling Requirements**

- a. Project seed and seedling requirements;
- b. Identify the key steps and determine the overall schedule for organizing and supervising a cone collection program (collect, store, handle and ship cones);
- c. Handle cones and seeds with level of care that will ensure that collection is protected from damage;
- d. Outline the seed extraction, storage and withdrawal procedures and timing;
- e. Outline methods of growing planting stock in bareroot and container nurseries;
- f. Describe in detail the effect on seedlings of different cultural regimes and demonstrate the assessment of morphological quality and suitability for intended purpose;
- g. Illustrate fully an understanding and appreciation for the effects of seedling stresses and the methods used to minimize these when handling, storing, shipping and planting seedlings;
- h. Recommend stock types and species based on environmental site limiting factors; and
- i. Recommend natural or planting reforestation methods with regard to the advantages and disadvantages of each and the impact on treatment scheduling.

### **3. Vegetation Management**

- a. Collect relevant data required to evaluate vegetation competition;
- b. Assess the vegetation competition hazard and evaluate vegetation management options including prevention, manual and chemical treatments;
- c. Plan and conduct brushing and weeding and conifer release programs;
- d. Describe the properties of herbicides, the regulations for their use, the method of application and environmental risks;
- e. Recommend vegetation management treatments with regard to silviculture goals and the goals of other forest resource users.

### **4. Silviculture Recommendations**

- a. Define and describe the legal implications and requirements for silviculture prescription
- b. Prepare a detailed, defensible stand level prescription for a given site with consideration for requirements under the FRPA.

### **5. Incremental Silviculture**

- a. Describe incremental silviculture in B.C. as it varies from basic;
- b. Describe the basic principles, goals and impacts on growth and yield of thinning, pruning and fertilization;
- c. Review the preparation of a stand management prescriptions;

### **6.**

- a. Review stocking survey requirements and procedures
- b. Conduct a free growing survey to provincial standards;

**REQUIRED REFERENCES:**

1. Lavender, D.P., et al (eds.). 1990. *Regenerating British Columbia's Forests*. Government of Canada/Province of B.C. UBC Press. (library copies available)
2. Silviculture Branch.2008. *Silviculture Survey Procedures Manual - Stocking and Free Growing Survey*. Ministry of Forests and Range. Victoria, BC.
3. B.C. Ministry of Forests. 2000. *Establishment to free growing guidebook. Prince George Forest Region*. Rev. ed., Version 2.2. For. Prac. Br., B.C. Min. For., Victoria, B.C. Forest Practices Code of BC Guidebook.

**ADDITIONAL REFERENCES:**

1. Adams, R.W.(ed). 1988 *Handbook for Pesticide Applicators and Dispensers*. Ministry of Environment. Crown Publishing Inc. Victoria.
2. Daniel, Helms and Baker. 1979. *Principles of Silviculture*, second edition. McGraw Hill.
3. Duryea, M.L.(ed).1985 *Evaluating Seedling Quality: Workshop*. O.S.U., Corvallis, Oregon 97331.
4. Eis, S. and D. Craigdallie.1981. *Reproduction of Conifers*.CFS. BC-X-219
5. Eremko, E. and Wallinger.1989. *A Guide to Collecting Cones of B.C. Conifers*. FRDA.
6. Ford and Robertson(ed). 1971. *Terminology of Forest Science, Technology Practice and Products*. Society of American Foresters.
7. Krajina, V.J. (ed). 1969. *Ecology of Western North America*, Vol.1&2. Department of Botany, U.B.C.
8. Newton and Knight.1981. *Handbook of Weed and Insect Control Chemicals for Resource Managers*. Timber Press, Oregon.
9. Nyland, R.D. 1996. *Silviculture Concepts and Application*. The McGraw-Hill Companies Inc. New York.
10. Silviculture Branch. *Silviculture Manual*. Ministry of Forests and Range. Victoria, BC.
11. Smith, D.M. 1986. *The Practice of Silviculture*, Eighth edition. Wiley.
12. Spurr and Barnes.1980.*Forest Ecology*. 3rd edition. Wiley.
13. Valentine, et al (ed). 1978. *Soil Landscapes of British Columbia*. Resource Analysis Branch, Ministry of the Environment, Victoria.
14. Watts, S.B.(ed). 1983. *Forestry handbook for British Columbia*, fourth edition. Forestry Undergraduate Society, UBC.
15. Wright, J.W.1976.*Intoduction to Forest Genetics*. Academic Press.

**SAFETY:**

Students must provide their own basic field equipment and be appropriately dressed for field trips. Unless otherwise notified by the instructor, hard hats, rain gear and sturdy boots are mandatory for all field trips.

STUDENT EVALUATION		LETTER GRADE / PERCENTAGES	
Lab Assignments	30%	A+	90 % - 100 %
Midterm Exam (s)/Quizzes	30%	A	85 % - 89.9 %
Silviculture Prescription	10%	A-	80 % - 84.9 %
Final Exam	25%	B+	76 % - 79.9 %
Instructor Assessment	5%	B	72 % - 75.9 %
		B-	68 % - 71.9 %
		C+	64 % - 67.9%
		C	60 % - 63.9%
		C-	55 % - 59.9%
		D	50 % - 54.9%
		F	0 % - 49.9%

#### EXPECTATIONS:

- To register in this course, a student must obtain a “C” grade or better in the prerequisite course/courses required for this course or obtain permission from the instructor.
- All assignments must be submitted on time. Late assignments will receive up to 50% mark reduction and assignments more than three days late will be given a zero mark. All assignment must still be submitted to complete course work. **Failure to do so will result in an 'I' grade being assigned.**
- Inability to complete all assignments and exams to at least a minimum standard acceptable to the instructor will result in an 'I' grade for the course.
- All assignments will be submitted in a format specified by the instructor. Failure to meet the minimum standard will result in return of the work for improvement.
- Work substantially copied from others is considered to be plagiarism. All parties involved in the work will be treated as per CNC policy.
- Students must receive passing grades in all evaluated areas (term work and exam portions) of the course or a failure for the course will be recorded.
- **The highest standards of attendance and participation are expected.** Missed classes and / or labs may result in additional homework assignments. If your absence is unavoidable, you are expected to notify the instructor in advance, as you would in an employment situation.
- Instructor assessment is based on attendance, punctuality, participation and attitude.
- There is no provision for supplemental exams. Grades received are final. Students must be present at the time of examination in order to be eligible to take or write exams.
- Any student who requires accommodations as a result of a disability must advise both the instructor and disability support services.

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**TERM TIME TABLE**

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(Subject to Change)			
Week #	Date	Lecture	Lab
1	5-Jan	Course Introduction Review course outline Site Plan review. Phases of basic silviculture activities	Seed preparation for sowing  Site Plan review. Phases of basic silviculture activities (continued)
2	12-Jan	Site Preparation introduction  Mechanical site preparation <ul style="list-style-type: none"> <li>• Slides of site prep</li> <li>• disc trenching video</li> </ul>	Mechanical site preparation and microsite modification study  Crop Plan: Phase I assignment
3	19-Jan	Mechanical site preparation <ul style="list-style-type: none"> <li>• Mounding video</li> </ul> Plant seeds for germination study lab	NSC Winter workshop attendance
4	26-Jan	Chemical Site preparation Prescribed Fire and smoke management	Prescribed Fire Planning: Setting burn targets and evaluation of effectiveness Burn parameters, burn plan
5	2-Feb	Prescribed fire (continued) Forest Regeneration Nature vs. planting programs Cone and seed handling	Prescribed fire (continued)  Crop Plan Phase I revisions Phase II assigned
6	9-Feb	Forest Regeneration Part I Natural vs. planting programs  <b>Midterm #1</b>	Seed growing lab final data collection and review <ul style="list-style-type: none"> <li>• Bud cutting</li> <li>• Cone crop assessment</li> <li>• Seed maturity/quality assessment</li> </ul>
7	16-Feb	<i>Study Week</i>	<i>Study Week</i>

8	23-Feb	Forest Regeneration Part II Seed and cones: seed development Slide tape #4 (cone collection and handling)	Review of key points of seed lab Phase II work session
9	2-Mar	Seed and Cones Seed development, genetic breeding Seedling production development and current practice	Cone crop collection slide review Seedling assessment lab
10	9-Mar	Seedling production development and current practice	Phase II review and Phase III assigned Complete seedling assessment
11	16-Mar	Vegetation Management Control methods: Chemical control <b>Midterm #2</b>	Silviculture Surveys – reading #1 SP phase III
12	23-Mar	<b>Easter Monday</b>	Vegetation management (continued) Silviculture Surveys reading #2
13	30-Mar	Silviculture Surveys	Silviculture Surveys Summary exercise Field plot sample of Free growing stand
14	6-Apr	Coast Field Tour departs 4 Apr.	Free growing survey April 15
15	13-Apr	<b>Field Week</b>	<b>Final Exam start April 16</b>
16	20-Apr	<b>Final Exams</b>	

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