



Forest Resources Technology Program

SILVICULTURE I FOREST STAND MANAGEMENT & SILVICULTURAL SYSTEMS FRST 231 Course Outline

Term: FALL
Lecture: TBA
Instructor: TBA

CALENDAR DESCRIPTION

An introduction to forest stand management and silviculture systems (the art and science of establishing, managing and tending forest stands); the science and methodologies used to manage the forests of BC for timber and other resource values. (2:0:2)

SCOPE AND CREDIT

Silviculture is traditionally viewed as the art and science of establishing and tending forests to meet specific management objectives, including but not exclusively for the production of timber. The focus of *SILVICULTURE I* is to introduce students to the various theories, concepts and principles of silviculture and to promote an understanding and appreciation of how forest stands of British Columbia grow and develop and the factors that influence their productivity and management. Specific techniques and treatments used to control the establishment and development of the forest such as regeneration methods, forest fertilization, pruning, site preparation, and conifer release will be addressed in *SILVICULTURE II*.

PREREQUISITES

FRST 131 and 132 or equivalent botany and terrestrial ecology courses, FRST 151 and 152 or equivalent soil science course, FRST 143 - Forest Hydrology - and FRST 234 – Site Diagnosis and Ecosystem Classification; FRST 235 (Forest Ecology II) must be taken concurrently.

COURSE CONTENT

Specifically, FRST 231 will cover the following:

- A definition of current and classic **silviculture**; a discussion on social perspectives of forest management and silviculture; the law and government/corporate responsibilities relative to silviculture and forest management; basic and intensive silviculture.
- The Forest Stewardship Plans and Site Plans as legal requirement and as tools in the planning hierarchy, and in identifying resource management objectives and values – a guide to silviculture planning.
- A review of natural disturbances in the forest environment and how they influence stand establishment, development and succession.
- Principles of stand dynamics and development, classification of forest stands, stand growth and yield determination and projections site productivity determination
- Forest estate and stand management planning, stand rotation, product and management objectives, and, to a limited extent, fiber flow.
- Classic and more recently developed silvicultural systems; how and when they are or should be used, the conditions and factors that are considered and taken into account when selecting a system.

TEXTS & SUPPLIES

There is no required text for this course although the following are recommended texts and publications for reference:

- Silviculture Manual, BC Ministry of Forests & Range
- The Practice of Silviculture, Smith, Wiley, 1986
- Silviculture Concepts and Applications, Nyland, McGraw-Hill, 1996
- Principles of Silviculture, Daniels, Helms, and Baker, McGraw-Hill, 1979
- Forestry Handbook, U.B.C. Forestry Undergraduate Society, 1983
- Ecosystems of B.C., B.C. Ministry of Forests & Range, 1991
- Regenerating Oregon's Forests, Cleary et al., Oregon State University School of Forestry 1978
- Regenerating British Columbia's Forests, Ed. by Lavender, Parish, Johnson, Montgomery, Vyse, Willis, and Winston, U.B.C. Press, 1990
- Instructional Hand-outs
- Forest Practices Code Act of BC
- Forest & Range Practices Act
- Forest Stand Dynamics by C.D. Oliver and B.C. Larson
- Silvicultural Systems by J.D. Mathews
- A Critique of Silviculture by Puettmann, Coates, and Messier, 2009

COURSE FORMAT

The course will be lecture and discussion based with a number of labs and assignments. Most weeks, the time allotment for silviculture will be broken into two phases, a one hour lecture period followed by a field lab session that may or may not be related to the lecture phase. As such, on any day, we may be dealing with two separate subjects.

LEARNING OUTCOMES

Upon successful completion of this course, students will be able to:

- Assess the potential hazards of working in the forest; demonstrate safe work procedures for carrying out tasks, and use appropriate personal protective equipment requirements and describe emergency procedures.
- Define and use technical terms applicable to silviculture in conversation with peers and when reviewing technical reports.
- Discuss silviculture on a scientific, legal, and socio-economic level.
- Describe and differentiate the various stand development phases through a succession or rotation.
- Differentiate between "basic" and "intensive or incremental" silviculture practices from the British Columbia forestry perspective.
- Discuss classic and more commonly used silvicultural and forest reproduction systems and how they can be applied to British Columbia forests.
- Integrate principles of silviculture and the biogeoclimatic classification system to determine appropriate forest reproduction systems.
- Apply basic principles and concepts of forest ecology, including site productivity, species' tolerance, natural disturbance processes, forest dynamics and succession, to forest management and silviculture planning.
- Illustrate the value of comprehensive silviculture strategies and their function in integrated forest management planning.
- Discuss the role of silviculture in timber supply planning and describe the various types of stand rotations as they relate to management objectives.
- Calculate the annual harvest level given a set of operational parameters and a stand data set.

In addition to the subject-specific learning outcomes listed above, specific program learning outcomes will be included in the course materials and objectives. Upon successful completion of this course students will have furthered their ability to:

- **Analyse field information & think critically;** students will be required to collect and analyse stand data and produce stand management prescriptions
- **Work collaboratively with others;** students will collaborate with their colleagues to collect and analyse field data.

- **Think creatively and flexibly;** students will be required to develop stand management prescriptions that offer alternative approaches to conventional approaches.

EVALUATION (sample)

Grade Breakout:

Mid-term tests	2@10%	20%
Lab assignments		40%
Final exam		20%
Term Project		10%
Professionalism		10%

NOTE: Students will be responsible for all materials introduced and/or discussed in class.

Grade Conversion: VIU's grade conversion table can be found in the D2L Forestry Portal

Academic Policies:

For information on exam policies, missing tests, assignment format standards, late assignments, instructor assessment and academic misconduct (e.g., plagiarism), please refer to the VIU Forestry Department website: <https://www2.viu.ca/forestry/Current-Students/VIU-Policies/index.asp> or in the **D2L Forestry Portal**

Late Assignments

Grades for late assignments, without a legitimate reason, will be reduced by 10% per calendar day. Students turning in late assignments are required to indicate the late penalty % on the cover page of their assignment (e.g. "2 days late, – 20%"). Late assignments will automatically receive a zero grade if submitted after the instructor has returned the graded assignments to the rest of the class.

Students are required to attend and participate in all field portions of lab exercises, failure to do so will result in an automatic zero for the lab assignment.

Instructor Assessment

The Professionalism assessment will be based on student's attendance, promptness, effort, attitude & behavior, class participation and ability to work independently.

SCHEDULE – sample

Modules	Topics
Module 1	<p>Introduction to the course:</p> <ul style="list-style-type: none"> -Silviculture defined in general and specific terms -The history of silviculture and use of silviculture as a planning tool -During the first few weeks, we will take a cursory look at all the various forest stand management practices that are generally considered to be silviculture approaches and practices. -Factors and forces that drive silviculture - the ecosystem, the species, the legislation, social and economic values, the Forest Stewardship & Site Plans. <p>Silviculture and forest estate planning; natural disturbances and their influence on forest planning.</p>
	Interior Field trip
Module 2	<p>Stand dynamics, structure and classification</p> <p>Site productivity and yield determination</p>
	<p>Thanksgiving - no class</p> <p>Midterm exam</p>
Module 3	Stand Rotations
Module 4	Determination of harvest levels and allowable annual cuts
Module 5	<p>Introduction to the traditional and the more contemporary silvicultural systems and forest reproduction methods.</p>
	<p>Even Aged Stands</p> <ul style="list-style-type: none"> Clear cut Retention Seed Tree Shelterwood
	<p>Remembrance day - no class</p> <p>Midterm exam</p>
	<p>Uneven aged Stands (or structured forests)</p> <ul style="list-style-type: none"> Single tree Selection Group Selection <p>Coppice Systems</p>
Module 6	Managing the forest estate for timber yields and non-timber resource values