VANCOUVER ISLAND UNIVERSITY
SCIENCE & TECHNOLOGY
FORESTRY

FRST 132
Forest Ecology I: Ecosystems & Silvics

Spring Course Outline

Location & Times: TBA

Instructor: TBA

Description

This course is an introduction to forest ecology and the application of ecological concepts and principles to forest resource management. The course introduces the basic components, processes and functions of ecosystems; explores the principles and methodology of classifying forest ecosystems; and examines the silvics of commercial trees in BC, with an emphasis on coastal species. Topics include: species and community ecology, natural disturbances, succession, and the Biogeoclimatic Ecosystem Classification (BEC) system.

Forest ecology is the study of forest ecosystems, including their structure and functions, and how these components interact and change over time. Silvics is the study of biological characteristics of individual tree species and forest stands, including life cycles, growth and reproduction, distribution, and adaptation to varying climate and site conditions. Classification facilitates communication and organization of our knowledge of ecosystems. Forest ecology, silvics and ecosystem classification are the foundation for the practice of silviculture. An understanding of tree species and forest development helps foresters predict forest ecosystem responses to both natural and human-caused disturbances.

Students will become familiar with the silvics of a number of commercial tree species, further their knowledge of the Biogeoclimatic Ecosystem Classification system in British Columbia, and develop a basic understanding of how to apply and integrate silvical and ecological knowledge in the description of forest ecosystems by performing a site diagnosis.

Scope and Credit

This course is designed for students in the first year of the Forest Resources Technology Program. The VIU FRT program is accredited by the Canadian Technology Accreditation Board. Prerequisite: FRST 131 – Forest Botany. **Credits: 2**

Course Format

The term will consist of three hours of lecture/lab weekly; some field trips or outdoor labs may require scheduling a longer time period. Students should be physically fit and have the proper attire for late winter and early spring weather conditions. [2:0:1]

Textbooks and Supplies

Required digital references (on iPad):

- Green, R.N. and K. Klinka. 1994. ***A Field Guide to Site Identification and Interpretation for the Vancouver Forest Region***, BC Land Management Handbook No. 28, BC Ministry of Forests, 285 p. [aka "The Red Book"] http://www.for.gov.bc.ca/hfd/pubs/docs/Lmh/Lmh28.htm
- Watts, S.B. and L. Tolland (Eds.). 2005. ***Forestry Handbook for British Columbia***, 5th Edition, The Forestry Undergraduate Society, UBC Faculty of Forestry, 773 p. http://www.forestry.ubc.ca/publications/forestry-handbook/
- Meidinger, D. and J. Pojar. 1991. ***Ecosystems of British Columbia***, BC Ministry of Forests. http://www.for.gov.bc.ca/hfd/pubs/Docs/Srs/Srs06.htm
- E.O. Wilson. 2014. ***Life on Earth***. iBook available from Apple, iTunes store.

Supplies: You are required to have the following items:

- Six-ring field binder (preferably Duksbak No. 30), waterproof notepaper and pencils
- Compass with adjustable declination
- Biodegradable flagging tape
- Personal first aid kit

Field Labs: Personal protective equipment (caulk boots, hard hat, hi-viz vest, safety eyewear or wire mesh face shield, safety whistle), first aid kit and appropriate clothing (raingear and gloves, as needed) are required for outdoor labs. Students inadequately dressed or equipped may be dismissed.

Learning Outcomes

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

1. 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.
2. Define and use the technical terms applicable to forest ecology in conversation with peers and technical reports.
3. Explain the role of silvics, forest ecology and ecosystem classification in sustainable forest resource management.
4. Identify and explain factors that determine the distribution of tree species and forest ecosystems.
5. Describe the dynamic nature of forest environments, including the role of natural disturbance and succession in shaping forest attributes.
6. Explain the basis of forest productivity, the role of nutrient cycling, and the importance of other major ecosystem processes and functions.
7. Describe the ecological and silvical characteristics of selected tree species native to British Columbia.
8. Identify and describe the major features of the 16 biogeoclimatic zones in British Columbia.
9. Compare and contrast the key characteristics of biogeoclimatic zones, sub-zones and variants found in the southern coastal region of British Columbia.
10. Apply basic site diagnosis procedures for ecosystem classification in the field.

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

1. Read, comprehend and summarize material appropriate to the field of forestry, specifically forest ecology and how to interpret and explain information presented in graphs.
2. Learn independently by preparing reports or presentations from individual research and by summarizing assigned readings.
3. Speak effectively in front of a group.

Course Communications

All information regarding the course will be distributed through the course "D2L" website through **VIU Learn** at: **http://learn.viu.ca**

You will be automatically enrolled in the FRST112 website with your course registration. You are responsible for checking the website at least weekly for notices and assignments. If your email has changed since registration, make sure that you provide an up-to-date version.

Outdoor labs and field trips will be cancelled only when extreme weather compromises safety or the learning objectives (e.g., excessive wind or snowfall). When in doubt, check for updates on D2L.

Academic Policies

For further information on exam policies, missing tests, assignment format standards, late assignments, instructor assessment and academic misconduct (e.g., plagiarism), please refer to the D2L Forestry Portal.

Assignments and Readings

The format and other specifications for assignments will be provided in a written description, including the due date and time. Marks will be deducted for late assignments. No marks will be awarded if marked work has already been returned to the rest of the class.

Required readings will supplement the lecture material. These readings may or may not be discussed in class but your understanding of these readings will be assessed in quizzes and exams.

Evaluation (sample)

Here is the breakdown of how your grade in the course will be determined (subject to adjustments):

Site diagnosis lab	**10%**
Silvics Project	**15%**
Quizzes	**20%**
Midterm Exam	**20%**
Final Exam	**25%**
Professionalism	**10%**

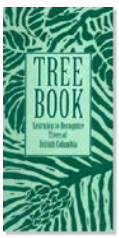
Quizzes will cover recent lectures and any assigned reading material. Missed quizzes receive a mark of zero. There will be no surprise or "pop" quizzes. The dates for all quizzes and exams are in the course schedule.

Grades will be calculated using the VIU standard grade scale (see D2L Forestry Portal).

Useful Web References

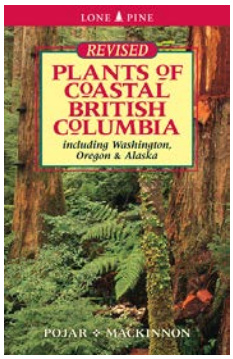
Here some useful references covering silvics and ecosystem classification:

- ***BECWeb: Biogeoclimatic Ecosystem Classification Program in BC***. http://www.for.gov.bc.ca/hre/becweb
- Burns, Russell M., and Barbara H. Honkala, Tech. Coords. 1990. ***Silvics of North America: 1. Conifers; 2. Hardwoods***. Agric. Handbk. 654. USDA, Forest Service, Washington, DC. vol.2, 877 p. http://www.na.fs.fed.us/spfo/pubs/silvics_manual/table_of_contents.htm
- Klinka, K., J.Worrall, L.Skoda and P.Varga, 2000. ***The Distribution and Synopsis of Ecological and Silvical Characteristics of Tree Species of British Columbia***, Canadian Cartographics Ltd. http://www.for.gov.bc.ca/hfp/silviculture/Compendium/index.htm
- Parish, R. and S. Thompson, ***Tree Book - Learning to Recognize Trees of BC,*** Canadian Forest Service. http://www.for.gov.bc.ca/hfd/library/documents/treebook



Additional References

- Brayshaw, T. C. 1996, ***Trees and Shrubs of British Columbia***, UBC Press.
- Farrar, J.L., 1995, ***Trees in Canada***, Canadian Forest Service, Fitzhenry and Whiteside.
- Kimmins, J.P. 2004. ***Forest Ecology: A Foundation for Sustainable Forest Management and Environmental Ethics in Forestry,*** 3rd Edition, Prentice-Hall, 611 pp.
- Klinka, K., V.J. Krajina, A. Ceska and A.M. Scagel. 1989. ***Indicator Plants of Coastal British Columbia***, UBC Press.
- Pojar, J. and A. MacKinnon. 2005, ***Plants of Coastal British Columbia, Revised***, Lone Pine Press



Sample Course Schedule

Week	Lecture Topic	Activities
1	Introduction to forests, forest ecology and course	Ecosystem attribute panels
2	Ecosystem components, cycles, trophic levels	Quiz #1 Interpreting graphs
3	The physical environment: climate and physiography	Quiz #2 Field trip to "The Abyss"
4	Populations and communities: niche, competition, tolerance	
5	Ecosystem dynamics: disturbance, succession	Quiz #3 Pair & Share
6	**Midterm EXAM** (first hour) Intro to Silvics	"Adopt a tree" (for Silvics)
7	Silvics: pine, spruce, Douglas-fir, larch	Arboretum lab
8	**Study Days**	
9	Silvics: true fir, hemlock, cedars, hardwoods	Quiz #4
10	**Silvics presentations**	Silvics assignment due
11	Intro to BEC - climate	BEC Web
12	BEC - site series	Quiz #5 Field trip to Morrell
13	Site diagnosis	Quiz #6 Site classification exercise
14	Field – no lecture	Site diagnosis lab
	Study Days, Final Exams	Date of final exam TBA

FRST132 – Reading Assignments(sample)

Week	Lecture Topic	Pre-Reading Assignment
1	Introduction to forests, forest ecology and course	HO: Ecological terms (ongoing)
2	Ecosystem components, cycles, trophic levels	FH: 434-443 LOE: Chapter 37
3	The physical environment: climate and physiography	EBC: 39-45
4	Populations & communities niche, competition, tolerance	FH: 451-452, 455 (Figs. 6 & 7) LOE: Chapter 40
5	Ecosystem dynamics: disturbance, succession	HO: Succession
6	**Midterm EXAM** (1st hour) Intro to Silvics	
7	Silvics: pine, spruce, Douglas-fir, larch	FH: 326, 331-338, 341 HO: Silvics synopsis (ongoing) HO: Silvics, seral traits
8	**Study Days**	
9	Silvics: true fir, hemlock, cedars, hardwoods	FH: 327-330, 339-340, 342-344
10	**Silvics presentations**	
11	Intro to BEC - climate	EBC: 10-25,52,153-165,209-220,223-235 (IDF, SBS, ESSF)
12	BEC - site series	RB: 4-10, 33-45, 46-70 (CDF, MHmm, CWHxm, dm, mm, vm, vh) RB: 71-77 106,107 (CDF, CWHxm)
13	Site diagnosis	RB: 11-32, 269-279 (App. 2-6)
14	Field – no lecture	

References: FH=Forestry Handbook, EBC=Ecosystems of BC, HO=Handout, LOE=Life on Earth (Wilson 2014), RB=Red Book (Green & Klinka 1994)