



VANCOUVER ISLAND
UNIVERSITY

SCIENCE & TECHNOLOGY

FORESTRY

Forestry Department

Soil Science II

Forestry 152

Course Outline

Term: Spring
Lectures/Labs: TBA
Instructor:

CALENDAR DESCRIPTION

This course is a continuation of Soil Science I with a greater focus on soil chemical properties and understanding the relationship between soil, the forest environment and tree growth. Students will be introduced to the fundamentals of geology and geological processes, rock forming minerals as a source of nutrients, soil development processes, soil and humus form classification, soil organisms and organic matter processing and nutrient cycling, and forest floor development.

This course is accepted towards VIU's Bachelor of Science, Major in Biology degree.
(1:0:2)

SCOPE AND CREDIT

This course receives 1.5 credits towards the Forest Resources Technology program and is a prerequisite to FRST 234, 231, 233 and 232.

COURSE FORMAT

This course is intended and designed for students in the first year of the Forest Resources Technology program, the Forest Undergraduate Transfer program and those pursuing an undergraduate degree in environmental sciences. The term will consist of a one hour of lecture and a two hour lab sessions per week.

PREREQUISITES: Successful completion of FRST 151 and 143

LEARNING OUTCOMES

On successful completion of this 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 soils in conversation with peers and technical reports.
3. Describe the origin and the role of organic matter in soils.
4. Describe and classify humus forms using the British Columbia humus form classification system.
5. Describe the primary and secondary sources of nutrients and how they are made available to plants.
6. Explain the processes of pedogenesis and nutrient production.
7. Explain nutrient cycling in forest environments and the role of macro and microorganisms in the process of nutrient cycling and supply.
8. Identify the common rock types found in British Columbia, silicate rock forming minerals and their role in nutrient supply

Independent Study:

Due to the limited class time available for this course, students will be required to carry-out independent study and research. The topics and materials that students will have to research will be assigned as required.

The Independent Study reports will be graded on content completeness and accuracy (50%), report format and presentation (25%), and English (25%).

REFERENCES

Most of the information you will require will be available as instructional handouts. However, a great deal of additional information is available on specific topics of geology, soils, hydrology and ecology in the school library. In addition, you may chose to supplement lecture notes with information from the following:

- Soil Landscapes in B.C., 1978, MoE
- Brady, N. C., Weil, R. R., 1999. The Nature and Properties of Soils. 12th ed. Prentice Hall, Upper Saddle River, NJ. 881 pp.
- Pritchett, W.L., Fisher, R. F., 1987. Properties and Management of Forest Soils, 2nd ed. John Wiley & Sons, New York. 494 pp.
- Terrain Classification System, 1978, MoE
- Forestry Handbook
- The identification of common rocks
[Information circular 1987-5]
Mineral Resources Division
Geological Survey Branch - BC Government

TEXTS & SUPPLIES

Field equipment and drafting supplies, as used in Forestry 131T & Forestry 111T, must be available.

EXAMS

There will be two mid-terms and one final exam.

EVALUATION (sample)

Grade Breakout:

- First midterm 15 %
- Second midterm test 15 %
- Final test 20 %
- Term Assignment 10 %
- Labs 30 %
- Professionalism¹ 10 %

¹This mark will be assigned based on the student's promptness, effort, attitude & behaviour, honesty & integrity, class participation and ability to work independently.

The following conversion will be used to determine the Final grade.

Grade Conversion:

Percentage (%)	Letter Grade	Grade Point
90-100	A+	4.33
85-89	A	4.00
80-84	A-	3.67
76-79	B+	3.33
72-75	B	3.00
68-71	B-	2.67
64-67	C+	2.33
60-63	C	2.00
55-59	C-	1.67
50-54	D	1.00
0-49	F	0.00

Grading Policies:

Missing Tests

Students missing any exam, test or quiz, unable to provide legitimate reason (illness or personal situation of a serious nature) for their absence, will be credited with zero for the missed exam or quiz. Normally, students will not be permitted to write exams or quizzes before or after the test has been given to the class.

Plagiarism – Refer to the Forestry Website for details

Assignment Submission Standards:

All assignments and reports will have a title page and include the course name, assignment title, the student's name the name of the course, the instructor and the date of submission. The assignment, unless otherwise specified, will be type written with double spacing and under no circumstances will anything be written on the back of any page. Only material on the front of the page(s) will be graded. **All non-original material must be cited and referenced.**

Examination Policy – Refer to the Forestry Website for details

Critical dates:

- Mid-term Test #1
- **BC Family Day – no classes**
- **Spring Reading Week**
- Mid-term Test #2
- Term Assignment Due Date
- **Last day of Classes**

Topics to be covered:

1. Slope Instability and Mass Wasting
2. Introduction to the fundamentals of geology and rock forming minerals
3. Soil forming processes.
4. Soil Taxonomy and the Canadian System of Soil Classification
5. Organic matter in the forest environment
6. Organic matter processing and nutrient cycling
7. Humus forms and Forest Floor classification
8. Nutrient balance and nutrient cycling

PROPOSED TERM AGENDA (sample)

Module	Topic
1	Slope Instability and Mass Wasting
2	Introduction to rock forming minerals, geology and geological processes. This module will also review nutrient requirements for plant growth and development.
3	Introduction to solum forming processes - chemical weathering and nutrient release. Soil activity/acidity and its effect on nutrient availability.
	Midterm #1
4	Introduction to clay mineralogy and Cation/Anion Exchange Capacity.
5	Introduction to soil taxonomy and the Canadian System of Soil classification. Introduction to common Soil Orders of BC
	Mid Term #2
6	Organic matter in soil – sources, soil organisms and organic matter processing and nutrient cycling. Forest floor and humus classification

- Lab #1 Soil Profile Description and soil collection in the field
- Lab #2 Identification of common Minerals & Rocks
- Lab #3 Determination of soil salinity and soil activity (pH)
- Lab #4 Cation Exchange Capacity
- Lab #5 Brunisol or Podzols – by analysis
- Lab #6 Determination of soil organic matter content