APBI_V 301 – SOIL, PEOPLE AND LANDSCAPE

TERM 1 – Sept – Dec 2025

ACKNOWLEDGEMENT

UBC's Point Grey Campus is located on the traditional, ancestral, and unceded territory of the xʷməθkʷəy̓əm (Musqueam) people. The land it is situated on has always been a place of learning for the Musqueam people, who for millennia have passed on their culture, history, and traditions from one generation to the next on this site.

Acknowledgements are nothing without action. In this course, we aim to contribute to decolonizing the discipline of soil science to support the efforts of the Land to maintain homeostasis.

COURSE INFORMATION

Course Title	Course Code Number	Credit Value	schedule
Soil, People and Landscape	APBI _V 301	3	Tuesday, Thursday 11.00-12.30 Mandatory 3-night pre-course field Trip August 2025

PREREQUISITES

APBI 200 Introduction to Soil Science or equivalent

CONTACTS

Instructional Team		Contact Details	Office Location	Office Hours
Instructor	Jean-Thomas Cornelis Alyssa Robinson	jt.cornelis@ubc.ca alyssajr@student.ubc.ca	McMl 225 McMl 144	Fridays, 1.00-2.00pm McMl 144
TA	Sasha Pollet	sashapol@student.ubc.ca	McMl124	t.b.a. McMl 124

COURSE INSTRUCTOR BIOGRAPHICAL STATEMENT

As a Belgian-born Associate Professor at UBC and settler currently living and working on the unceded ancestral lands of the Musqueam people in Vancouver, I am mindful of the ongoing impacts of colonialism and dispossession that have displaced Indigenous Peoples from their lands in so-called British Columbia.

My research explores deep-time relationships between land, people, and soil, in co-creation with Indigenous communities. I approach this work with humility, knowing that soil holds not only physical memory but also cultural, spiritual, and historical resonance.

I am the father of two boys, Antonin and Robin, and through them I'm constantly reminded of the importance of curiosity, care, and imagination. I carry my Belgian roots—shaped by a love of surrealism and a commitment to authenticity, reciprocity, creativity, and fluidity—with me in my work and relationships. I strive to listen deeply, to unlearn where needed, and to engage in research that is not only collaborative but genuinely relational, grounded in respect for Indigenous knowledges and sovereignty.

My SoilRes^3 Lab at UBC (https://soilres3.landfood.ubc.ca/) has expertise in soil processes and terrestrial biogeochemistry, and a specific focus on studying soil-forming factors and processes, as well as their controls on ecological functions. My research interests are rooted in investigating the interactions between physicochemical and biological processes to better understand soil-plant interactions and feedback and their benefits for terrestrial ecosystem functioning. You can also find out more at https://www.landfood.ubc.ca/jean-thomas-cornelis or follow our SoilRes3 Instagram account (formerly Twitter) @soilres3_lab_ubc

COURSE RATIONALE - WHY STUDY SOILS IN THE LANDSCAPE?

In this course, we will explore the complexity of soil systems and their integration across multiple scales and disciplines. Focusing on the diverse environments of British Columbia, we will examine how historical relationships between land and people have shaped soil formation over time. By studying key environmental factors—such as parent material, climate, and land use—we will gain insight into soil–plant interactions and soil profile development, essential for sustainable land use and management.

Key topics include **pedology**, **soil genesis**, and **classification**, which are fundamental for land resource management practices and policy. This course is foundational for students seeking deeper understanding in these areas.

COURSE STRUCTURE AND DELIVERY

Year/Term: Winter 2025-2026, Term 1
To give students more personalized and effective learning in the field, this course is **capped to 25 students**.

1. In-class learning:

Tuesday and Thursday 11:00 a.m. - 12:30 p.m. in-person class

Class location: SWNG 308

During the opening weeks of the term, **JT Cornelis** will deliver a series of **lectures** that organized into thematic modules. We will begin by exploring fundamental concepts of soil genesis and landscape distribution, and how these processes shape soil physico-chemical properties. Next, we will apply principles of soil taxonomy, focusing on the 10 soil orders and key suborders using the Canadian System of Soil

Classification (3rd edition). The module will also include an introduction to the 32 soil groups defined by the International World Reference Base (WRB) classification system.

For the remainder of the term, **Alyssa Robinson** will lead the course, which will primarily follow a flipped classroom format. Students will engage with soil survey reports and research articles prior to class, where the material will be explored through group discussions. The readings and collaborative **group work** will be organized into three modules:

1. Environmental controls on soil type distribution (using the BC Soil Information Finder Tool), and the interpretation of pedological data
2. Key principles of ethnopedology
3. The influence of ancestral land stewardship by Indigenous Peoples on soil and ecosystem functioning

In the final weeks of the term, students will deliver a 15-minute case study presentation analyzing the key environmental drivers and long-term human–ecosystem relationships influencing soil distribution. Students will apply soil taxonomy principles to classify soils, critically interpret their properties and ecological functions, and propose informed recommendations for land use and management.

Readings will be assigned prior to the start of each group work session, and will include class handouts, journal articles, and soil textbook chapters. Readings will be posted in Canvas.

2. In-field learning:

A mandatory 3-night pre-course field trip: A journey through soil-human-ecosystem diversity in BC Lower Mainland

No additional fees will be charged.

*From Tuesday **August 26th**, 5pm to **Friday 29th**, 11am*

Our **field camp**[1] will be located in Chehalis River Campground – we will coordinate transport (more information can be found in the field school book, that will be shared with students right after course registration deadline, August 12th, 2025)

During the field trip, we will explore the diversity of soil-forming factors, soil genesis, and how deep time human-ecosystem relationships have influenced the distribution of soil properties and uses in the landscape. We will be welcomed on the traditional land of the Sts'ailes Indigenous community, a sovereign Coast Salish First Nation, with the unique opportunity to learn more about Ancestral Indigenous forest garden practices. Sts'ailes Xa'xa Temexw includes the entirety of Harrison Lake, Harrison River, Chehalis Lake, Chehalis River, the lower Lillooet River, the northeastern portion of Stave Lake, and the Fraser River between Hooknose and Queens Island.

We will apply the principles of soil taxonomy from the Canadian System of Soil Classification, third version, to describe and classify the studied soil profiles, which will be then converted into the World Reference Base for soil resources (as the international soil classification system). We will study how variations in parent material, topography, vegetation, land use and management can lead to the formation of a series of

[1] Students with accessibility concerns should reach out to the instructor prior to the beginning of the course

different soil types, including the following orders: Podzolic, Luvisolic, Regosolic, Gleysolic and Organic. Through a careful analysis of soil physicochemical and morphological properties in the studied soil profiles, we aim to understand the main soil-forming factors and processes controlling soil properties and ecological functions in BC Lower Mainland and their related ecological functions.

Students will analyse and interpret:

- the changes of soil physicochemical characteristics depending on environmental factors and their distribution in the landscape,
- the implications of soil properties changes in the landscape according to their potential ecological functions,

while applying

- the principles of soil classification of the Canadian System of Soil Classification, third version and the conversion to the International soil classification (WRB 2014; IUSS)

LEARNING OUTCOMES

Upon completion of APBI 301 successful students will be able to:

1. Integrate the fundamental soil science concepts to **apply** taxonomic principles of the Canadian System of Soil Classification (CSSC) to classify soils and **compare** CSSC soil types with the International WRB classification system.
2. **Identify** environmental factors and long-term human activities that affect soil formation and development of soil profiles in a landscape
3. **Explain** how variations in environmental factors and soil-human interactions affect soil properties and ecological functioning.
4. **Describe** soil physicochemical data and the evolution of soil types in a landscape using concepts of soil taxonomy
5. **Analyze** the environmental factors that control the distribution of soil types in a landscape to **evaluat**e land use and sustainable soil management.

Schedule 2025

Any changes to the schedule will be announced on Canvas. Please be sure you are receiving Canvas announcements for this course.

Date	Day	Instructor	Topic
Aug 26	Tue	JT Cornelis Alyssa Robinson Sasha Pollet	**A journey through soil-human-ecosystem diversity in BC Lower Mainland** *Transportation from UBC (August 26, 3pm) to Chehalis River campsite will be coordinated by the Instructor. See Canvas and field school book for additional details.* *Return to campus on August 29th, 11am* Investigation of long-term Land and People relationship: two eyes seeing approach – Indigenous way of knowing, Traditional Ecological knowledge together with principles from pedology and archaeology disciplines
Aug 27	Wed	JT Cornelis Alyssa Robinson Sasha Pollet	
Aug 28	Thu	JT Cornelis Alyssa Robinson Sasha Pollet	

Aug 29	Fri	JT Cornelis Alyssa Robinson Sasha Pollet	
Week 1	Tuesday	No class	Imagine Day
	Thursday	JT Cornelis	Lecture 0: Brain warm-up – Long-term Land and People relationships
Week 2	Tuesday	JT Cornelis	Lecture 1: Soil pedon and soil horizons - pedology principles
	Thursday	JT Cornelis	Lecture 2: soil distribution in the landscape
Week 3	Tuesday	JT Cornelis	Lecture 3: Quantification of major soil properties Assignment #1 - group: Field notes and soil description form for your Sts'ailes soil profile + final table of soil morphological description
	Thursday	JT Cornelis	Lecture 4: Soil classification principles: Canadian and USDA Soil taxonomy
Week 4	Tuesday	JT Cornelis	Lecture 5: The Canadian System of Soil Classification
	Thursday	JT Cornelis	Lecture 6: World Reference Base for Soil Resources
Week 5	Tuesday	Alyssa Robinson	Group work 1: Environmental controls on soil type distribution, with application of the BC Soil Information Finder Tool (SIFT)
	Thursday	Alyssa Robinson	Group work 1: Environmental controls on soil type distribution, with application of the BC Soil Information Finder Tool (SIFT)
Week 6	Tuesday	Alyssa Robinson	Group work 1: Environmental controls on soil type distribution, with application of the BC Soil Information Finder Tool (SIFT)
	Thursday	Alyssa Robinson	Assignment #2 – group: soil distribution in the landscape and pedological data interpretation
Week 7	Tuesday	Alyssa Robinson	Lecture 7: ethnopedology principles
	Thursday	Alyssa Robinson	Group work 2: critical analysis of ethnopedological studies – results and implications
Week 8	Tuesday	Alyssa Robinson	Group work 2: critical analysis of ethnopedological studies – results and implications

	Thursday	Alyssa Robinson	Group work 2: critical analysis of ethnopedological studies – results and implications
Week 9	Tuesday	Alyssa Robinson	Assignment #3 – group: in-class talk presenting the context of the study, the main results and implications of Indigenous land stewardship on soil properties
	Thursday	Alyssa Robinson	Assignment #3 – group: in-class talk presenting the context of the study, the main results and implications of Indigenous land stewardship on soil properties
Week 10	Tuesday		Preparing for the mid-term exam
	Thursday	Alyssa Robinson	Mid-term exam – individual: summary of the main soil-forming factors and processes responsible for the formation of 3 soil orders – critical analysis on their C sequestration capacity based on classification criteria
Week 11	Tuesday	No class	Reading week
	Thursday	No class	
Week 12	Tuesday	Alyssa Robinson	Lecture 8: influence of ancestral land stewardship on changes in soil classification and properties
	Thursday	Alyssa Robinson	Group work 3: influence of ancestral land stewardship on changes in soil classification and properties
Week 13	Tuesday	Alyssa Robinson	Group work 3: influence of ancestral land stewardship on changes in soil classification and properties
	Thursday	Study case presentation	Assignement #4 – group: influence of ancestral land stewardship on changes in soil properties Course wrap-up – cake party
Week 14	Tuesday		Final report – individual: critical analysis of how Land-People relationships influence soil-forming processes and properties and how their consideration in soil classification could be revisited

LEARNING MATERIALS

Teaching Technology:

The UBC *Canvas* learning management system will be used throughout the course for course communication, assignment submission, grading etc. Course notes and pre-recorded videos are available in Canvas. Please see here for a student guide to using Canvas and for Canvas related technical support.

Students are NOT permitted to use **artificial intelligence tools**, including generative AI, to help produce assignments, and would be considered academic misconduct. While specific in-class learning activities can be organized with the use of AI, all answers in your assignments must be written in your own words.

Zoom will be used for virtual office hours, when specifically stated. A link to UBC Zoom can be found within the course Canvas site.

Readings:

Readings are organized by module and listed in Canvas. Required readings will be available via Canvas or links to the UBC Library.
Reference materials for additional information:

- The Canadian System of Soil Classification, third version
- The Soil landscapes of British Columbia
- Land Capability Classification for Agriculture in British Columbia
- Sanborn, 2016: The imprint of time on Canadian soil landscapes
- Soil Genesis and Geographical Distribution, by Dr. Sanborn (UNBC)
- Vancouver Geology, by Dr. John Armstrong
- *Digging into Canadian soils* "https://openpress.usask.ca/soilscience/"
- *The Nature and Property of Soils* by Brady and Weil,
- *Soil Formation* by van Breemen and Buurman
- *Pedology* by Duchauffour.
- *Virtual Soil Tour:* https://processes.soilweb.ca/

Given the relatively high cost of the proposed books, if you wish to consult them I am willing to share with you my personal copies.

LEARNING ACTIVITIES & ASSESSMENT OF LEARNING

The Environmental consulting sector (as one of the main employers of those with soil science knowledge) has identified the need for excellent technical communication skills based on the 5 Cs of communication - correct, clear, concise, consistent, and complete. We will use the 5 Cs approach to report writing in this course (assignments and exams).

Overview:

Activity		Weighting	Due date
Assignments (4)	Group	50%	
Midterm exam	Individual	25%	Nov 6th
Final report	Individual	25%	TBD

Assignments:

Individual/group written reports:

4 Assignments (12.5% each):

For each assignment, students will integrate concepts covered in class and the field trip regarding soil taxonomy and classification, soil profile data interpretation and the interpretation of how environmental factors control soil distribution in the landscape.

Submission of assignments*:* all assignments are to be submitted online in Canvas. If your file does not open, I will consider the assignment as not submitted.

Late assignments: assignments must be uploaded to Canvas by the due date. Individual assignments submitted beyond the due date will be subject to a -10% per day (including weekend days) late penalty; late assignments past day 4 will not be accepted. Recognizing life is not always a bed of roses, I remain open to discussion of well-justified specific cases. If you are having trouble meeting an assignment deadline, please let me know so that I can work with you and your advising office to come up with a plan to fulfill course requirements should you have documented medical or other extenuating circumstances.

Mid-term exam is in-person, on Canvas (essay format) (25%)

Final report: take-home final term individual report (25%).

The assignments, mid-term exam and final report will be assessed on the basis of content (i.e., scientific rigor and accuracy), organization, application potential, and originality/creativity, as follows:

20% - Clear structure and organization of your rationale

40% - Scientific rigor of your statements and accurate interpretation

10% - potential application and importance of your statement for Environmental consulting sector

30% - originality and creativity of your statements. How your interpretations and ideas can move the field forward, and towards new research avenues.

Retention of assignments/exam: Students have the right to view their marked examinations with their instructor, providing they apply to do so within a month of receiving their final grades. The examination remains the property of the university.

HOW TO GET HELP

There are two main platforms for you to get help with course content. 1) Virtual office hours, and 2) Post your questions to a Canvas discussion forum. I will not answer content related questions via email, as other students benefit from clarification – please use the discussion forum in Canvas. The instructor expected response times is 24h and respond to request 9-5 weekdays.

For non-content related questions, please email me via Canvas mail or use the “Office hour Sign Up” tool on Canvas. In-person Office hours can be arranged by appointment.

UNIVERSITY POLICIES

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access, including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions.

Details of the policies and how to access support are available on the UBC Senate website.

OTHER COURSE POLICIES

Academic Integrity:

Academic honesty is a core value of scholarship; all students are expected to know, understand and follow the codes of conduct regarding academic integrity. At the most basic level, this means submitting only original work done by you, and acknowledging all sources of information or ideas and attributing them to others as required. This also means you should not copy, present the work of others as your own, or self-plagiarize. Violations of academic integrity (i.e., misconduct) are taken very seriously at UBC, and harsh sanctions are imposed. Incidences of plagiarism or cheating may result in a mark of zero on an assignment or exam, and more serious consequences may apply when the matter is referred to the Office of the Dean. Careful records are kept in order to monitor and prevent recurrences. A more detailed description of academic integrity, including the University's policies and procedures, may be found in the UBC Calendar: Student Conduct and Discipline. Please contact me if you are unsure about these policies so that I can clarify them for you.

Early Alert:

During the term, I will do my best to reach out and offer support if I am concerned about your academic
performance or wellbeing. I also encourage you to come and speak with me, or with student services, if you need assistance. In addition, I may identify my concerns using Early Alert. The program is confidential and provides you with connection to resources such as academic advising, financial advising, counseling, or other resources and support to help you get back on track. For more information, please visit earlyalert.ubc.ca.

Academic Concession:

For the first occurrence of an acute illness (cold, flu or other) or compassionate grounds, a *self-declaration* will suffice. To request academic concession, please email me prior to the due date. A doctor's note is NOT required for this request. If you have an ongoing issue including: conflicting responsibilities, medical circumstance, or compassionate ground (e.g. death in the family) please contact your Faculty's advising office for guidance.

Once academic concession is granted, the weight of the missed assignment or midterm will be redistributed to the other course items of the same type. If you miss the final examination for reasons such as illness or family crisis, you must inform your Faculty's advising office of the reason for the absence in a timely manner (within a few days). Note that if you are ill for an exam and choose to write it, then the grade obtained on the examination will stand. There are no rewrites or make-ups of midterm or final examinations.

Assignment or exam regrades:

If you notice a potential grading error on an assignment or exam, please notify me (email or Canvas mail) as soon as possible.

To request a regrade of your final examination you must apply for a Review of Assigned Standing. Information on this process is found in the UBC calendar.

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I do not permit students to record my classes without prior approval.

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