APBI 401 - SOIL PROCESSES

TERM 1 – Sept – Dec 2020

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.

COURSE INFORMATION

Course Title	Course Code Number	Credit Value
Soil Processes	APBI 401	3

PREREQUISITES

APBI 200 Introduction to Soil Science or equivalent

CONTACTS

Instructional Team		Contact Details	Office Location	Office Hours
Instructor	Sandra Brown	sandra.brown@ubc.ca	McMl 229	Zoom time: t.b.a.
Academic contributors	Les Lavkulich Sue Grayston Cindy Prescott	lml@mail.ubc.ca sue.grayston@ubc.ca cindy.prescot@ubc.ca	McMl 127 FSC 3006 FSC 2005	
TA	Fernanda Díaz Osorio	canvas mail		

COURSE INSTRUCTOR BIOGRAPHICAL STATEMENT

I am an Assistant Professor of Teaching in Applied Biology in the Faculty of Land and Food Systems at UBC Vancouver campus. I am a geographer, with expertise in soil and water resources, and a specific focus on international development. My research interests include characterization of human impacts on soil and water resources. You can find out more at http://www.landfood.ubc.ca/person/sandra-brown/ or follow me on twitter @SandraBrownSoil

ACADEMIC CONTRIBUTORS

Three academic contributors provide content for this course:

- Les Lavkulich – mineral weathering, geochemistry
- Sue Grayston – microbial diversity and function
- Cindy Prescott – litter decomposition

Guest presentations will be moderated by Sandra, and materials will be provided in Canvas.

WHY STUDY SOIL PROCESSES?

Soils are a fundamental component of agro-ecological, forest and other land use systems; reflecting natural processes and the influence of human activities. Soil properties and processes regulate water and solute transport, the carbon cycle, nutrient and water cycles, energy fluxes and biomass productivity. An integrative approach covering the biological, chemical and physical properties and processes of soils is required to understand the functioning of natural and human modified ecosystems. Understanding soil processes helps us determine why soils at a particular location have the characteristics that they do, what soil properties are inherent, and how human activities may modify soil characteristics. Knowledge of soil processes is fundamental to the management of land resources, from both practical and policy perspectives. For students interested in gaining more depth in understanding soil processes, APBI 401 is a foundational course.

COURSE STRUCTURE – BLENDED

Year/Term:	Winter 2020-2021, Term 1
Course Schedule:	**Mondays 5:00 - 7:00 p.m. Vancouver time –** synchronous, required
	Wednesdays 11:00 a.m. - 12:00 noon Vancouver time – synchronous, optional
	Exception: Oct 14 class required (due to Thanksgiving holiday Monday)
Class location:	Zoom (link within Canvas)

This course will be taught using a modular format. We will focus on four core areas: the weathering of soil parent materials, soil-water availability for crops and ecosystems, the transformation of soil organic matter, and the human alteration of nutrient cycles (see the course map at the end of this syllabus).

Monday class time – this will be our live virtual classes; and will include a mix of short presentations, break-out groups, and discussion sessions covering core theory and its application. Materials to review prior to class will provided in Canvas, and will include pre-recorded mini-lectures, readings and online resources. The blended approach being used this year, implies you will need to undertake some self-directed learning. In addition, some asynchronous group activities will occur throughout the term.

Wednesday class time – will largely function as a tutorial where you can get clarification on course content or assignments. Note however, we will hold a required class on Wed Oct 14 11:00-12:00 noon. Midterm exams will also occur on Wednesday, however you will be given multiple times to select from.

Classes and break-out sessions will be scheduled in Zoom (link with Canvas).

LEARNING OUTCOMES

Upon completion of APBI 401 successful students will be able to:

1. articulate key soil physical, chemical and biological processes
2. integrate fundamental soil processes and apply concepts to assess soil characteristics, & their influence on water and nutrient availability for plants
3. predict soil behaviour as a result of land management practices
4. critically reflect on alternative practices and policies to mitigate human impacts on soils

SCHEDULE OF TOPICS

Week	Module	Live class	Optional tutorial	Due Dates
Sept 9-13	Welcome to 401/501 The Soil (review – soil physical characteristics)	n.a.	Sept 9	Signed honesty pledge Sept 13
	Module 1: From Sediment to Soil			
Sept 14-20	Geological & soils Factors of soil formation (parent materials)	Sept 14	Sept 16	Group charter Sept 16 *Rocks & minerals*
Sept 21-27	Primary silicate minerals Phyllosilicate clay minerals Weathering sequence	Sept 21	Sept 23	-homework (ungraded) Sept 14 -group assignment Sept 16 -individual report Sept 20
Sept 28-Oct 4	Soil colloids Exchange reactions	Sept 28	Sept 30	*Soils of the UBC Campus* -individual report Sept 30
Oct 5-11	Module 1 review	Oct 5	none	***Midterm 1* – open book** Oct 7
	Module 2: Soil-Water (availability for crops & ecosystems)			
Oct 12-18	Water retention in soils Water movement in soils (saturated & unsaturated) *Oct 12 Thanksgiving holiday*	**Oct 14**	(class)	*Soil water retention* -individual report due Oct 16
Oct 19-25	Infiltration & Irrigation	Oct 19	Oct 21	*Irrigation* -group assignment Oct 21 -individual report Oct 25
Oct 26-Nov 1	Module 2 review	Oct 26	None	***Midterm 2* – open book** Oct 28
	Module 3: OM transformation			
Nov 2-8	Soil organisms & the soil food web The role of organisms in OM decomposition	Nov 2	Nov 4	*Soil food web* -homework (ungraded) Nov 2 - group assignment Nov 8
Nov 9-15	Litter quality Decomposition & nutrient mineralization Nov 11 Remembrance day	Nov 9	Holiday	*Litter quality* -homework (ungraded) Nov 9 -individual report Nov 15

	Module 4: Human Alteration of Nutrient Cycles			
Nov 16-22	N cycle & Human alteration of N cycle	Nov 16	Nov 18	*Farm nutrient budget* -homework (ungraded) Nov 23 -group assignment Nov 25 -individual report Nov 30
Nov 23-29	P cycle & Peak P	Nov 23	Nov 25	
Nov 30-Dec 3	C cycle & Climate smart soils Course Summary	Nov 30	Dec 2	
Dec 7-22	Final exam (known question)			date t.b.a.

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

LEARNING MATERIALS

Teaching Technology:

The UBC *Canvas* learning management system will be used throughout the course for course communication, assignment submission, grading etc. Please see here for a student guide to using Canvas and for Canvas related technical support.

iPeer will be used for self and team member evaluation. iPeer can be accessed here. The support email for iPeer is also located on this page.

Zoom will be used for virtual classes and break-out sessions. A link to UBC Zoom can be found within the course Canvas site.

Please do not email the instructor or the TA for technical support issues. We cannot solve these issues and this will only further delay your efforts. Please DO let us know if something is missing or not working properly on the Canvas/iPeer course sites – this may be something we can fix and will help us resolve the issue for all class members.

Readings:

Readings are organized by module and listed in canvas. Required readings will be available via the Library Online Course Reserves and/or links to the UBC Library. The book *The Nature and Property of Soils* by Brady and Weil is highly recommended. However, I recognize the relatively high cost of this text. If you wish to order *The Nature and Property of Soils* it is available in the UBC bookstore. Any recent addition is fine and used editions are often available through online book sellers.

LEARNING ACTIVITIES & ASSESSMENT OF LEARNING

Overview:

Activity		Weight	Associated Learning Outcomes
Assignments	Individual (n=6)	50%	2, 3, 4
	Group (n=4)	5%	1, 4
Participation	iPeer	5%	1, 4
Midterm exams	Open book (n=2)	20%	1
Final exam	Seen question[1]	20%	1, 2

[1] In seen question exams students are given questions ahead of time (see details below)

Assignments: include group submissions and individual reports.

***Group assignments*:** are low stake, peer-to-peer projects designed to help you individually complete your more complex written reports. Group assignments will include the names of students who contributed; failure to contribute to your group will results in a grade of 0.

***Individual written reports*:** will integrate concepts covered in class via calculations, data interpretation and the application of concepts for soils, plants and/or the environment. Specific details for each assignment will be posted in Canvas. A generic rubric is included at the end of the syllabus; specific rubrics will be provided in Canvas for each assignment.

Submission of assignments: all assignments are to be submitted online in Canvas in word (doc or docx), pdf, or pptx and xls formats only. If your file does not open, I will consider the assignment as not submitted.

Late assignments: Group assignments must be uploaded to Canvas prior to the due date (no late group assignments will be accepted). Individual assignments submitted beyond the due date will be subject to a -10% per day (including weekend days) late penalty, maximum 4 days.

If you are having trouble meeting an assignment deadline, please let me and your teammates know as soon as possible so that your group can move forward with their work. 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.

Participation: will be based on peer-feedback gathered after each group assignment using iPeer.

Midterm exams: will be open book, and consist of 3 short answer questions, duration 50 minutes. All answers must be written in your own words. Study questions and a practice exam will be posted in Canvas. No make-up exams will be offered.

Final exam: will be scheduled by classroom services during the exam schedule (Dec 3-22, 2020). The final exam will be cumulative. Questions will be posted 3 days prior to the exam (i.e., a seen question exam), however, not all of the posted questions will be on the exam, and you will not know the exact format of individual questions until the exam (e.g., 150 word synopsis, 500 word mini-essay, a drawn schematic or combination…). All answers must be prepared by individual students and written in your own words.

Retention of assignments: Students should retain a copy of all submitted assignments (in case of loss). 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.

Grading guidelines: see http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,42,96,0

Percentage (%)	Letter Grade	Percentage (%)	Letter Grade
90-100	A+	85-89	A
80-84	A-	76-79	B+
72-75	B	68-71	B-
64-67	C+	60-63	C
55-59	C-	50-54	D
0-49	F (Fail)		

HOW TO GET HELP

There are two main platforms for you to get help with course content. 1) Instructor and TA drop-in sessions Wednesday 11:00 a.m. to 12:00 noon, 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.

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.

During this pandemic, the shift to online learning has greatly altered teaching and studying at UBC, including changes to health and safety considerations. Keep in mind that some UBC courses might cover topics that are censored or considered illegal by non-Canadian governments. This may include, but is not limited to, human rights, representative government, defamation, obscenity, gender or sexuality, and historical or current geopolitical controversies. If you are a student living abroad, you will be subject to the laws of your local jurisdiction, and your local authorities might limit your access to course material or take punitive action against you. UBC is strongly committed to academic freedom, but has no control over foreign authorities (please visit http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,33,86,0 for an articulation of the values of the University conveyed in the Senate Statement on Academic Freedom). Thus, we recognize that students will have legitimate reason to exercise caution in studying certain subjects. If you have concerns regarding your personal situation, consider postponing taking a course with manifest risks, until you are back on campus or reach out to your academic advisor to find substitute courses. For further information and support, please visit: https://academic.ubc.ca/support-resources/freedom-expression

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.

*If you or one of your family members has the **COVID-19** virus, please contact Student Services immediately, so that we can explore concessions (if needed) that will not impact your grades negatively.*

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.

LEARNING ANALYTICS

Learning analytics includes the collection and analysis of data about learners to improve teaching and learning. This course will be using the following learning technologies: Canvas, iPeer, Zoom, OnTask. Many of these tools capture data about your activity and provide information that can be used to improve the quality of teaching and learning. In this course, I plan to use analytics data to:

- View overall class progress
- Track your progress in order to provide you with personalized feedback
- Review statistics on course content being accessed to support improvements in the course
- Assess your participation in the course

COPYRIGHT

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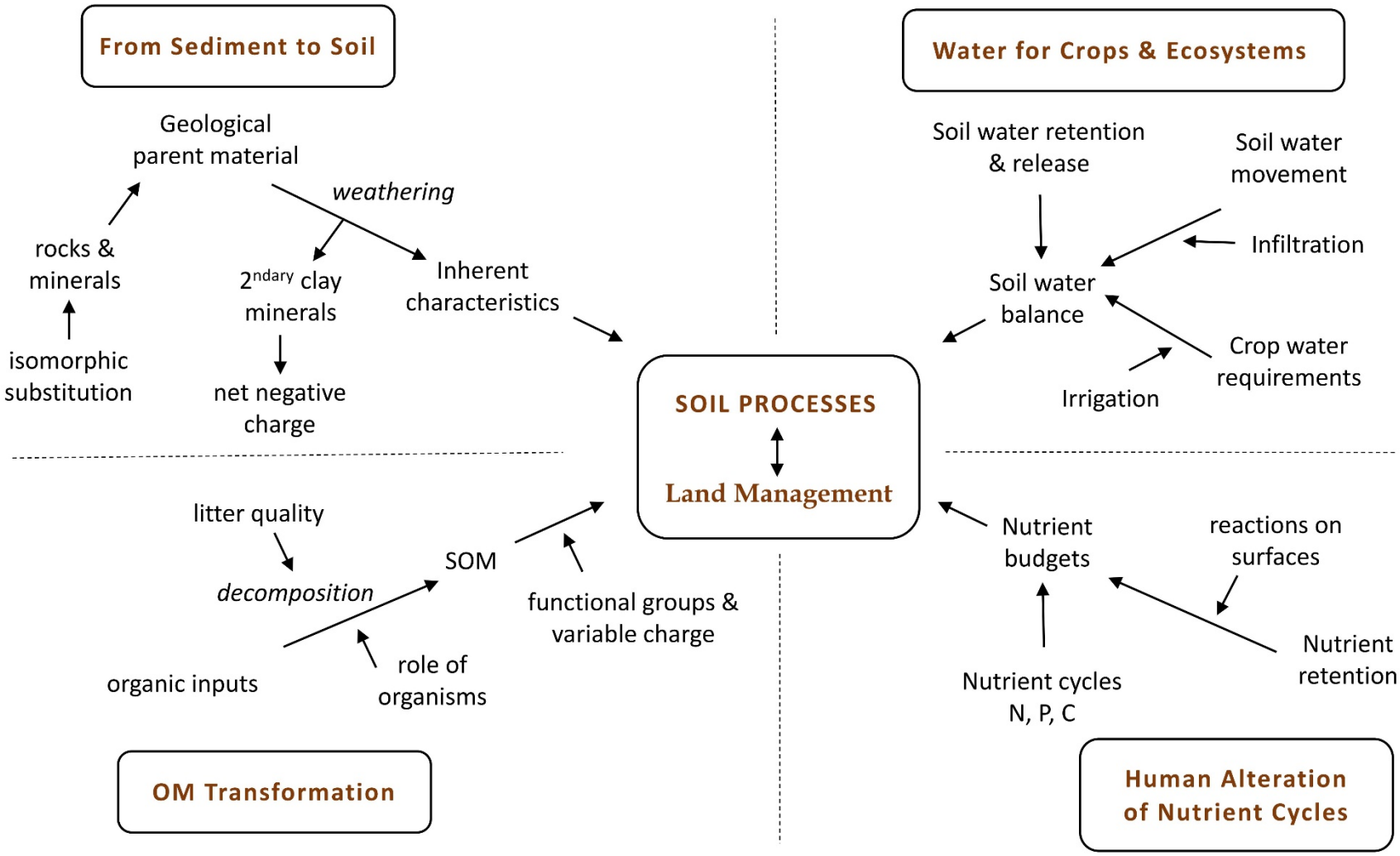
I do not permit students to record my classes without prior approval.

Version: Sept 4, 2020

APBI 401 Course Map



Generic Grading Rubric for Assignments

	Excellent	Good	Satisfactory	Unsatisfactory
Calculations (20-50%)	90-100% of steps and solutions are completed with no errors (mathematical or in formulas)	Almost all (80-89%) of steps and solutions completed without errors	Most (70-79%) steps and solutions completed without errors	Less than 70% of steps and solutions attempted or have errors
Interpretation (20-50%)	Interpretation of data detailed and clear; includes all key components and concepts	Interpretation of data clear and includes key components and concepts; lacks some detail	Data interpretation difficult to understand but includes key components and concepts	Data interpretation difficult to understand and is missing several key components; or interpretation lacking
Application / importance (20-40%)	Clear focus on relevant soil characteristics; detailed assessment of the importance of soil processes for plants and/or for the environment	Focus on major soil characteristics; demonstrates the importance of soil processes for plants and/or for the environment; lacks some detail	Not all relevant soil characteristics or processes considered; lacks depth	Fails to demonstrate an understanding of key soil processes and their importance for plants and/or the environment
Structure, organization, grammar, references (5-10%)	Report is presented in a well-organized, logical order; diagrams or sketches provide additional clarity; easy to read, few grammatical errors; sources referenced	Report is presented in a well-organized manner; diagrams or sketches used where appropriate; easy to read, few grammatical errors; sources referenced	Report lacks logical organization; diagrams or sketches not clear; some grammatical errors; not all sources referenced	Report unorganized, difficult to read; diagrams or sketches not used; many grammatical / spelling errors; sources not referenced

Note: specific rubrics for individual assignments will be posted in Canvas.