

Soil Properties, GEOG 3108

Carleton University
Department of Geography & Environmental Studies
Fall 2017

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Office Hours: Monday (11:30am-12:30am) and (2pm-3pm)

INTRODUCTION

This course provides students with a fundamental knowledge of soil science. The main learning objectives are to: (1) characterize the basic physical, chemical and biological properties of soils; (2) to become familiar with soil formation, classification (based on the Canadian System of Soil Classification), survey and mapping; and (3) become familiar with environmental issues related to soil science. The topics in this course are important to students interested in the biophysical sciences and to students who wish to understand the processes underlying many human, social and economic aspects of our environment and natural resources.

COURSE FORMAT

Lectures will follow the attached course outline. The lectures will introduce and illustrate the major concepts in biogeography. Support material will be available on the cuLearn course site.

SCHEDULE

Lectures: Monday 8:35am- 10:25am in Mackenzie Building 4494

Lab sessions: - section A02: Wednesday 8:35am-11:25am in Loeb Building A120
- section A03: Wednesday 11:35am-2:25pm in Loeb Building A120
- section A04: Wednesday 2:35pm-5:25pm in Loeb Building A120

RECOMMENDED TEXTBOOK

Brady, N.C. and R.R. Weil. 2016. The Nature and Properties of Soils. 15th edition, Prentice Hall, New Jersey. Note: previous editions of this text are also acceptable.

The text contains more information than can be covered in an introductory course. However, it is a valuable reference on terminology, properties, processes and principles. Background reading in the text will be useful for nearly all topics covered in the course. The soil classification system which we will use is the Canadian system. The text emphasizes the U.S. system. Handouts will be provided which describe the Canadian system.

STUDENT RESOURCES AND COMMUNICATION

Office Hours, Email and Appointments:

If you have questions pertaining to lecture material I encourage you to come to my office hours or to meet me at the end of class to make an appointment.

All questions about missed assignments, missed exams, and other practical concerns about the course should be directed to me by email. Emails will be responded to during business hours only. Please place the course number GEOG 3104 in the subject line.

cuLearn Course Site:

The cuLearn course site of GEOG 3104 contains information on all aspects of the course. It includes partial outlines of lectures (not complete notes) and graphs or diagrams presented in class. You need to

supplement these notes by attending the class lectures or by referring to the textbook. You will be able to access cuLearn course site and to download files on the first week of classes. If you are not able to login, please contact the course instructor.

EVALUATION

Final marks in the course are based on your performance in five categories as follows:

Participation	5%
Midterm Exam	25%
Lab assignments/Exercises	20%
Lab quiz	20%
Final Exam	30%

Participation

Students are expected to attend classes and to discuss the materials for each topic. Your attendance, asking questions, participation in class discussions, and timely submission of assignments will count towards your participation mark. Students who miss more than 4 classes without a medical note will forfeit their participation mark. A student who is consistently late for classes will be marked as absent.

Assignments

There will be 3 lab assignments (worth 20% of the final mark) to be handed in during the semester and one lab quiz (worth 20% of the final mark) in the last week of classes

- students will work together with other students during the lab times, but preparing of lab assignments for handing in should be an individual effort
- the lab quiz will test all of the material covered in the labs (even the unmarked labs) thus attendance at and completion of all labs is required
- all assignments should be handed in at the beginning of the lab period of the following week
- marks will be deducted (5% of the lab mark per day late) for assignments handed in late (unless discussed beforehand)

Exams

Exams will cover lecture and lab materials. Only students who have made prior arrangements with the instructor, or students who have contacted the instructor within 5 days of the missed exam with a valid doctor's note explaining why they missed the exam will be permitted to write the make-up exam. The final exam is not cumulative, it will only cover materials discussed after the midterm.

COURSE POLICIES

Late Assignments

Late assignments will be penalized by subtracting 10% per day (including Saturday and Sunday) of the total value of the assignment. Students whose assignments are late because of a valid medical reason or family emergency will not be penalized, however, documentation from a family physician or counseling services will be required.

Missed Assignments or Exams

Students who fail to submit an assignment or write the midterm or final exam will receive an automatic grade of zero. The only exceptions will be for instances of significant illness or a family emergency. Students confronted with these circumstances must consult with *Exam Services as soon as they are aware* that they will miss the test.

Academic Integrity

Academic integrity is a necessary foundation for all meaningful scholarly activity and verified instances of intellectual dishonesty will be dealt with in full accordance with the procedures laid out in Academic Integrity Policy. Additional information regarding what constitutes plagiarism may be found on Carleton University web site: <https://carleton.ca/secretariat/wp-content/uploads/Academic-Integrity-Policy.pdf> The Associate Dean of the Faculty conducts a rigorous investigation, including an interview with the student, when an instructor suspects a piece of work has been plagiarized. Penalties are not trivial. They can include a final grade of "F" for the course.

Pregnancy obligation: write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the Equity Services website: <http://www.carleton.ca/equity/>

Religious obligation: write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the Equity Services website: <http://www.carleton.ca/equity/>

Academic Accommodations for Students with Disabilities: The **Paul Menton Centre** for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your **Letter of Accommodation** at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (*if applicable*). After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website for the deadline to request accommodations for the formally-scheduled exam (*if applicable*) at <http://www.carleton.ca/pmc/new-and-current-students/dates-and-deadlines/> You can visit the Equity Services website to view the policies and to obtain more detailed information on academic accommodation at <http://www.carleton.ca/equity/>

Students representing Carleton University, Ontario or Canada (at academic or sports events):

I fully support students involved with organizations and teams that travel during the semester; however, with this privilege comes additional responsibility. You are responsible for providing formal documentation identifying the organization you represent and potential schedule conflicts with this course. In the event that you are travelling and unable to attend an exam, you must schedule a secondary exam before you depart. Without proper documentation, a missed exam will earn zero points.

HINTS FOR SUCCESS

It is in your best interest to attend class regularly and to participate in class. Try to keep up with your readings and address questions you have on the subject matter at the appropriate time rather than waiting until just before the midterm and final for clarification.

This course moves quickly through a large amount of material in a short time. Try to keep up with your readings and address questions you have on the subject matter at the appropriate time rather than waiting until just before the midterm and final for clarification.

IMPORTANT DATES

Oct 18	Midterm exam
Nov 22	lab quiz
Dec	Final exam

DRAFT

SOIL PROPERTIES (GEOG3108)
Fall term 2017 Course Outline

Week	Lecture	Lab	Readings
Sep 6	<i>NO CLASS</i>	<i>NO LAB</i>	
Sep 11-13	Introduction to the course Weathering, Parent Material	Rocks, Minerals and Parent Material	Ch. 1+ Ch. 2
Sep 18-20	Soil Horizons, Soil Description	Soil Description (6 marks)	Ch. 2+Ch.4 Handout
Sep 25-27	Soil Formation, Classification	Soil Description continued	Ch. 2+Ch.3 Handout
Oct 2-4	Soil Survey, Soil Physical Properties	Soil Classification	Ch.19+Ch.4
Oct 9-11	<i>OCT 9: STATUTORY HOLIDAY. UNIVERSITY CLOSED.</i>	Oct 11: Field Trip (6 marks)	
Oct 16	Soil Water	<i>NO LAB-Midterm week</i>	Ch.5
Oct 18	<i>Midterm Exam in our regular class room</i>	Soil Physical Properties (8 marks)	
Oct 23-27	<i>NO CLASS-WINTER BREAK</i>	<i>NO LAB-WINTER BREAK</i>	
Oct 30-Nov 1	Soil Air, Soil Temperature	Soil Physical Properties continued	Ch.7
Nov 6-8	Soil Colloids, Soil pH	Soil Texture, Soil pH	Ch.8+Ch.9
Nov 13-15	Soil Organisms, Soil Organic Matter	Review for lab quiz	Ch. 11+Ch.12
Nov 20-22	Soil Nitrogen, Soil Fertility	<i>LAB QUIZ</i>	Ch. 13+Ch.16
Nov 27-29	Soil Erosion	<i>NO LAB</i>	Ch. 17
Dec 4-6	Soil Pollution	<i>NO LAB</i>	Ch. 18
Dec	<i>FINAL EXAM (TBA)</i>		

Readings for GEOG 3108

- readings are from Brady 2016 (15th ed.), Brady 2008 (14th ed.), 2002, (13th ed.), 1999 (12th ed.)
- you should concentrate on the sections indicated below; all topics may not be covered in each semester (you will be told in class what will be covered)

	14 th and 15 th Ed.	13 th Ed.	12 th Ed.
Introduction	Ch. 1	Ch.1	Ch. 1
Weathering	2.1	2.1-2.3	2.1-2.3
Parent Material	2.3	2.5-2.12	2.5-2.12
Soil Formation	2.2-2.9	2.4,2.13-2.19	2.4, 2.13-2.19
Soil Description	handout, 4.1-4.6	handout, 4.1-4.4, 4.9	handout, 4.1-4.4, 4.9
Soil Classification	handout, 3.1	handout, 3.1	handout, 3.1
Soil Survey	19.7-19.8	19.7-19.8	19.7-19.8
Soil Physical Properties	4.7 – 4.9	4.5-4.10	4.5-4.10
Soil Air	7.1-7.7	7.1-7.7	7.1-7.8
Soil Temperature	7.8 – 7.12	7.8-7.12	7.9-7.13
Soil Water	Ch. 5	Ch. 5	Ch. 5
Soil Colloids	Ch. 8	Ch. 8	Ch. 8
Soil Acidity and pH	Ch. 9	Ch. 9	Ch. 9
Soil Organisms	Ch. 11	Ch. 11	Ch. 11
Soil Organic Matter	Ch. 12	Ch. 12	Ch. 12
Soil Nutrients: Introduction	1.17, 1.18	1.16,1.17	1.15, 1.16
Nitrogen	13.1 – 13.15	13.1-13.17	13.1-13.16
P and K	Ch. 14	Ch.14	Ch. 14
Micronutrients	Ch. 15	Ch. 15	Ch. 15
Fertilizers	16.7 – 16.9	16.7-16.8	16.11-16.13
Soil Erosion	Ch. 17	Ch. 17	Ch. 17
Soil Pollution	Ch. 18	Ch. 18	Ch. 18