

Soil Properties GEOG 3108A**[0.5 credit]****Fall 2026**Instructor: Elyn Humhreys, elyn.humphreys@carleton.ca**1. Course Description:**

This course will introduce you to the fundamentals of soil science, with emphasis on the physical and chemical properties of the solid (mineral and organic), liquid, and gas phases of soils. We will explore these soil properties & the role soil plays in our lives today from food production to climate change.

2. Preclusions: none**3. Learning outcomes:**

Students will describe the physical, chemical and biological properties of soils and use field and laboratory procedures to analyze these properties. Students will assess the impact of land management practices on key soil properties and functions including food production and mitigation of climate change.

4. Texts:

Course textbook (free, online open-access): Krzic, M., Walley, F.L., Diochon, A., Paré, M.C., & Farrell, R.E. (Eds.) 2021. *Digging into Canadian soils: An introduction to soil science*. Pinawa, MB: Canadian Society of Soil Science. <https://openpress.usask.ca/soilscience/>

All course materials will be made available on Brightspace. Student or professor materials created for this course (including presentations and posted notes, labs, assignments and exams) remain the intellectual property of the author(s). They are intended for personal use and may not be reproduced or redistributed without prior written consent of the author(s).

5. Course Calendar:

Lecture – Thursdays, 11:35 – 13:25

Lab Section A03 – Mondays, 11:35 – 14:25

Lab Section A01 – Mondays, 14:35 – 17:25

Week	Lecture	Lab
W1. Sept 8-11	L1. Overview & Introduction	<i>No lab periods this week</i>
W2. Sept 14-18	<i>No lecture this week</i>	<i>No lab periods this week</i>
W2. Sept 21-25	L2. Degradation of Soil Physical Properties	Lab 1. (Optional Saturday, Sept 26 field trip to Just Food Farm in Ottawa. <i>Lab 1 completed during field trip / Alternative written lab available</i>)
W3. Sept 28-Oct 2	L3. Degradation of Soil Physical Properties (Water Availability)	Lab 2
W4. Oct 5-9	L4. Degradation of Soil Physical Properties (Erosion)	Lab 3 – <i>Lab 2 due</i>
W5. Oct 12-16	L5. Quick Clay – part 1	<i>No labs this week on Thanksgiving Monday</i>
W6. Oct 19-23	L6. Quick Clay – part 2	Lab 4 – <i>Lab 3 due</i>
<i>Oct 12 - 16</i>	<i>Carleton University Reading Break</i>	
W7. Nov 2-6	Midterm test	<i>No lab periods this week</i>
W8. Nov 9-13	L7. Organic farming & soil fertility	Lab 5 – <i>Lab 4 due</i>

W9. Nov 16-20	L8. Organic farming & soil fertility(CEC)	Lab 6 - <i>Lab 5 due</i>
W10. Nov 23-27	L9. Organic farming & soil fertility (pH)	Lab 7. <i>Lab 6 due (Lab 7 completed during lab time)</i>
W11. Nov 30 – Dec 4	L10. Organic farming & soil fertility (soil biology)	<i>No labs this week</i>
W12. Dec 6 - 11	L11. Soil Genesis	<i>No labs this week</i>

6. Evaluation:

In-class activities/quizzes	8%	
Laboratory assignments (7)	40%	
Special Topic presentation	8%	
Mid-term test	24%	(Nov 5 in class)
Final exam	20%	(held during the exam period)

In-class participation: To receive these marks, you must be present in-class (no make-up activities/quizzes will be offered). There will be 11 class periods to earn these marks (earn up to 1% per class period).

Laboratory assignments: Seven assignments will help you further develop the concepts introduced during the lectures. Each lab assignment will be given equal weight towards the final lab grade.

Special topic presentation: You will present a special interest soil topic during the lecture periods starting Oct 7. Signup is available through Brightspace and must be completed by midnight, Sept 30 or you will be assigned a time slot. Example topics include soil & sports, environmental problems/solutions, weird/interesting soil phenomena, soils and natural disasters, food production, soil in the city (remediation, construction), soil careers, etc. I will present an example Sept 30. For ideas, google “soil in the news” or visit the online textbook “Can You Dig It!” sections. Upload your presentation slides as pdf or powerpoint (max 5) by midnight the day before your presentation (lateness policy applies). You have 5 min to present your topic. It must include source references and one question for the class related to soil properties that we have discussed to date (e.g. short answer or multiple choice or true or false).

Policy on lateness: Lab assignments will normally be submitted through Brightspace on the due date/time noted on the assignment. Late assignments will be penalized by 10% of the total value of the assignment for every additional day beginning immediately at the deadline and will not be accepted after assignments have been graded and returned. See section 8 below to request accommodation.

Exams: These will be limited time and include multiple choice and short paragraph answers.

Standing in a course is determined by the course instructor subject to the approval of the Faculty Dean. This means that grades submitted by the instructor may be subject to revision. No grades are final until they have been approved by the Dean.

7. Generative Artificial Intelligence (AI)

Any use of generative AI tools (e.g. Chat GPT) to produce assessed content in this course is considered a violation of academic integrity standards. See also statement on plagiarism below.

As our understanding of the uses of AI and its relationship to student work and academic integrity continue to evolve, students are required to discuss their use of AI in any circumstance not described here with the course instructor to ensure it supports the learning goals for the course.

8. Statement on Academic Integrity:

Collaboration is encouraged while working through the assignments, but each student must hand in their own individually prepared assignment.

It is not permissible to submit a substantially same piece of work more than once for academic credit.

Plagiarism will not be tolerated. Students should consult the [Academic Integrity Policy](#).

“The University Academic Integrity Policy defines plagiarism as ‘*presenting, whether intentionally or not, the ideas, expression of ideas or work of others as one’s own.*’ This includes reproducing or paraphrasing portions of someone else’s published or unpublished material, regardless of the source, and presenting these as one’s own without proper citation or reference to the original source. Examples of sources from which the ideas, expressions of ideas or works of others may be drawn from include but are not limited to books, articles, papers, literary compositions and phrases, performance compositions, chemical compounds, artworks, laboratory reports, research results, calculations and the results of calculations, diagrams, constructions, computer reports, computer code/software, material on the internet and/or conversations.”

Examples of plagiarism include, but are not limited to:

- any submission prepared in whole or in part, by someone else, including the unauthorized use of generative AI tools (e.g., ChatGPT)
- using ideas or direct, verbatim quotations, paraphrased material, algorithms, formulae, scientific or mathematical concepts, or ideas without appropriate acknowledgment in any academic assignment
- using another’s data or research findings without appropriate acknowledgement
- submitting a computer program developed in whole or in part by someone else, with or without modifications, as one’s own
- failing to acknowledge sources with proper citations when using another’s work and/or failing to use quotations marks.

Plagiarism is a serious offence that cannot be resolved directly by the course’s instructor. The Associate Dean of the Faculty follows a rigorous [process for academic integrity allegations](#), including reviewing documents and interviewing the student, when an instructor suspects a violation has been committed. Penalties for violations may include a final grade of “F” for the course.

7. Statement on Student Mental Health

As a student you may experience a range of mental health challenges that significantly impact your academic success and overall well-being. If you need help, please speak to someone. There are numerous resources available both on- and off-campus to support you. For more information, please consult <https://wellness.carleton.ca/>”

Emergency Resources ([on and off campus](#))

- Crisis/Urgent Counselling Support: 613-520-6674 (Mon-Fri, 8:30-4:30)
- Suicide Crisis Helpline: call or text 9-8-8, 24 hours a day, 7 days a week.
- For immediate danger or urgent medical support: call 9-1-1

Carleton Resources

- Mental Health and Wellbeing: <https://carleton.ca/wellness/>
- Health & Counselling Services: <https://carleton.ca/health/>

- Paul Menton Centre: <https://carleton.ca/pmc/>
- Academic Advising Centre (AAC): <https://carleton.ca/academicadvising/>
- Centre for Student Academic Support (CSAS): <https://carleton.ca/csas/>
- Equity & Inclusivity Communities: <https://carleton.ca/equity/>

Off Campus Resources

- Distress Centre of Ottawa and Region: call 613-238-3311, text 343-306-5550, or connect online at <https://www.dcottawa.on.ca/>
- Mental Health Crisis Service: call 613-722-6914 or toll-free 1-866-996-0991, or connect online at <http://www.crisisline.ca/>
- Good2Talk: call 1-866-925-5454 or connect online at <https://good2talk.ca/>
- The Walk-In Counselling Clinic: for online or on-site service <https://walkincounselling.com>

8. Requests for Academic Accommodations

Carleton is committed to providing academic accessibility for all individuals. You may need special arrangements to meet your academic obligations during the term. The accommodation request processes, including information about the *Academic Consideration Policy for Students in Medical and Other Extenuating Circumstances*, are outlined on the Academic Accommodations website (students.carleton.ca/course-outline).