

ERTH 2421 – A Geologic Tour of the National Parks of North America

Fall 2025

The concept of National Parks, created in the United States of America in 1872, stemmed primarily from the desire to preserve the incredible geology and scenery found in North America. The National Park Service in the United States of America, formalized in 1916, has a mandate to “promote and regulate the use of the Federal areas known as national parks, monuments, and reservations...to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.” This mantra has spread to many nations around the world, including Canada who established Rocky Mountains Park (later Banff National Park) as its first National Park and established the Rocky Mountains Park Act on June 23, 1887. Canada was the first nation to establish an agency to protect its National Parks with the creation of Parks Canada in 1911, 5 years before the United States created its National Park Service.

All the above was instrumental to aid in the preservation of the geology, scenery and resources of some of the most spectacular places in the world. Our goal in this course is to not just examine the parks but the geology, geologic processes and geologic history that underpins these incredible areas. We will use the National Parks of North America to learn about not only their geology but also what the geology preserved in these areas tells us about how our planet works as a whole. At the end of this course, you should be able to visit any park, even the many that we do not cover in this course, read the geological literature, or view the landscape and rocks of that park, and be able to explain some of the processes that created the park. You should also be able to describe some of the current research being conducted in our parks and have a good overall understanding of how our planet works.

Learning Outcomes:

By the end of the course, each successful student will acquire the following skills and knowledge sets:

- Each student will appreciate the role that National Parks play in our understanding of Earth Science at local, regional and global scales.
- Each student will demonstrate an understanding of the geologic, hydrologic and atmospheric Earth systems.
- Each student will apply scientific concepts and theories to develop scientific explanations of natural phenomena.
- Each student will demonstrate an understanding of the process of Earth formation and differentiation, the internal structure of Earth, and the Theory of Plate Tectonics.

Course Pre-requisites:

None.

Required Course Materials:

Textbook: Nesor, L. (2023). Introduction to Earth Science. CC BY-NC-SA 4.0, Retrieved from:

<https://pressbooks.lib.vt.edu/introeearthscience/>

Course Delivery Information:

This course will have in person lectures along with in class activities/discussion using Wooclap. There will be online assignments as part of this course. All online components of this course will be available and completed within Brightspace.

Course Evaluation:

There are three main components to the course including lecture activities, online assignments and lecture exams. These components are further outlined below with specific details posted on Brightspace and discussed in lecture modules.

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|---|------------|
| Lecture Activities (Wooclap, etc.) | 10% |
| Lecture Quizzes | 10% |
| Online Assignments | 30% |
| Lecture Exams | 50% |

Grading Scale:

| | | | |
|----|---------|----|--------|
| A+ | 90-100% | C | 63-66% |
| A | 85-89% | C- | 60-62% |
| A- | 80-84% | D+ | 57-59% |
| B+ | 77-79% | D | 53-56% |
| B | 73-76% | D- | 50-52% |
| B- | 70-72% | F | <50% |
| C+ | 67-69% | | |

Class Schedule

Lecture Time: TR 5:35-6:55 pm

Lecture Location: RB 2200

Student Hours: T 10:00-11:00 am

Instructor

Geoff Pignotta

Office: HP 2102

Phone: x3802

Email: geoff.pignotta@carleton.ca

Teaching Assistants: Information posted on Brightspace

Lecture:

Lectures are in person only. They will not be streamed or recorded. Lecture slides will be posted to Brightspace *after* lecture. A schedule of lecture topics and readings will be posted on Brightspace.

Lecture Activities:

Wooclap will be used in most lectures to evaluate your understanding of content and concepts throughout the term. A variety of question styles will be used including multiple choice, true/false, matching, and image identification type questions. You **MUST** use your @cmail account to be counted as participating or for graded activities. Instructions on how to use Wooclap and register for an account will be posted on Brightspace and covered in the first weeks of lecture. This is so that your responses can be linked to Brightspace and included in your grade. **NOTE:** the two lowest scores from your Wooclap lecture responses will be dropped. Therefore, if you need to miss a lecture for any reason, that can be dropped or if your phone loses charge, it can be dropped. Basically, you have 2 freebies for the term.

Lecture Quizzes:

Quizzes will consist of multiple choice, true-false, matching and short answer questions. These are designed to keep students on track with lecture content throughout the term. There will be 4 lecture quizzes (weighted equally) throughout the term that will be completed online through Brightspace. Quizzes will be timed, with timing information posted on Brightspace. Late or missed quizzes will receive a grade of zero.

Online Assignments:

Online assignments will consist of multiple choice, fill in the blanks, image interpretation and short answer questions that pertain to related lecture content. *The lecture assignments may not be directly linked to*

lecture material. The goal of the assignments is to extend lecture content and demonstrate how Earth Science is important in the National Park setting and in our daily lives. There will be 5 or 6, equally weighted assignments though the term. All assignments will be completed on Brightspace. Late assignments will *NOT* be accepted. Additional details regarding the assignments will be posted on Brightspace and discussed in lecture.

Lecture Exams:

These are *not cumulative* exams and will be taken **IN PERSON ONLY**. The lecture midterm exam will be held **OUTSIDE OF CLASS TIME**, with a date/time being determined by Scheduling and Examination Services. The *most likely date of the midterm exam will be **Friday October 17, 2025*** which is before the fall break. Please do not plan any travel that Friday. The midterm examination date/time and location will be relayed as soon as it has been scheduled. The final exam will be scheduled during the December exam period. Materials required for the lecture-based exams will be provided by the instructor.

Exams will consist of multiple choice, true/false, matching and short answer questions. The format for both midterm and final exams will be collaborative exams. Additional details regarding how the collaborative exams will be discussed in lecture, but the basic idea is that you will take the exam once individually, just like most tests/exams work with no talking, no notes, etc. You will turn that exam in after the set time. You will then take the same exam a second time, however during the second attempt you may collaborate with your classmates. You can speak to each other, use your course notes, my course notes or the textbook. The weighting of the exams will be 80% based on your individual effort and 20% on the collaborative effort.

Course Behavior/Expectations:

- Outside of lectures, you are expected to spend ~5-6 hours per week on this course. This includes readings, studying, online lecture quizzes and online assignments.
- I expect your behaviour to be respectful of all members of the course at all times.
- I will continually strive to create inclusive learning environments and would therefore appreciate your support and feedback.

Land Acknowledgement:

Here at Carleton University, it is important that we acknowledge that the land on which we gather is the traditional and unceded territory of the Algonquin nation.

Academic Accommodations:

Conflicts with Course Requirements:

Students with conflicts for **ANY** course requirement (quiz, assignment, etc.) due to illness or otherwise **MUST** be reported to the instructor **PRIOR** to the due date when possible. If this is not possible contact regarding a deferral must be made within **24 hours** of the deadline. If you require accommodations for this course that are longer than a 5-day period, please email me to discuss how/whether accommodation needs could be met for this course.

The following statement is required by the Carleton University Faculty of Science:

“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).”

Pregnancy obligation:

Please contact your instructor 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 Academic Accommodations website (students.carleton.ca/course-outline).

Religious obligation:

Please contact your instructor 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 Academic Accommodations website (students.carleton.ca/course-outline).

Academic Accommodations for Students with Disabilities:

If you have a documented disability requiring academic accommodations in this course, please contact the Paul Menton Centre for Students with Disabilities (PMC) at <https://carleton.ca/pmc/> or 613-520-6608 or pmc@carleton.ca for a formal evaluation. Contact your PMC coordinator to send your instructor your Letter of Accommodation at the beginning of the term. You must also contact the PMC no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, contact and/or meet with your instructor directly as soon as possible to ensure accommodation arrangements are made. For more details, visit the Academic Accommodations website (students.carleton.ca/course-outline).

Survivors of Sexual Violence:

As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and its survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: <http://carleton.ca/sexual-violence-support>. For more details, visit the Academic Accommodations website (students.carleton.ca/course-outline).

Accommodation for Student Activities:

Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor 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. <https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf>. For more details, visit the Academic Accommodations website (students.carleton.ca/course-outline).

Academic Consideration for Medical and Other Extenuating Circumstances:

Due to medical and other extenuating circumstances, students may occasionally be unable to fulfil the academic requirements of their course(s) in a timely manner. The University supports the academic development of students and aims to provide a fair environment for students to succeed academically. Medical and/or other extenuating circumstances are circumstances that are beyond a student's control, have a significant impact on the student's capacity to meet their academic obligations, and could not have reasonably been prevented. Students may request Academic Consideration for Coursework or Other Academic Deliverable. For further information please review the [Procedure for Academic Consideration](#) and the [FAQ](#) page. For more details, visit the Academic Accommodations website (students.carleton.ca/course-outline).

Plagiarism:

Plagiarism is presenting, whether intentionally or not, the ideas, expression of ideas, or work of others as one's own. Plagiarism 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, art works, laboratory reports, research results, calculations and the results of calculations, diagrams, constructions, computer reports, computer code/software (including AI), and material on the internet. This includes copying of material from websites or other publications that is incorporated into **assignments**, reports, or other submissions for grading. Borrowing someone else's answers, unauthorized possession of tests or answers to tests, or possession of material designed in answering exam questions, are all subject to university policy regarding instructional offences.

For this course (and all other courses at Carleton), it is extremely important to understand that you cannot copy and paste material from websites or publications into the assignment answer boxes on Brightspace. This is plagiarism, and it is easy to spot during grading of assignments. When formulating an answer to an assignment question, be sure to reword the material from websites or publications into your own words, then type that into the answer boxes. Identification of plagiarised material in an assignment answer will result in an automatic zero points for that question. Repeated instances of plagiarism will result in harsher consequences that may include zero on entire an entire assignment, reduction of course final grade, withdrawal from course, letter of reprimand from the Dean of the Faculty of Science.

I encourage students to work together and have engaging discussions. **HOWEVER**, each student must submit answers to assignments/reflections in their own words, not the words used by another student that you are working with. If the answers submitted by one student for an assignment are identical to those submitted by another student, *both students will be assigned a grade of zero for the activity*.

Academic dishonesty, in whatever form, is destructive to the values of the university, and risks harming the university's reputation as place of learning and innovation. Furthermore, it is unfair and discouraging to those students who pursue their studies honestly. Additional details regarding the Carleton University Academic Integrity policy: <http://carleton.ca/secretariat/wp-content/uploads/Academic-Integrity-Policy.pdf>

AI Use in this course:

Students may use AI tools for basic word processing and formatting functions, including:

- Grammar and spell checking (e.g., Grammarly, Microsoft Word Editor)
- Basic formatting and design suggestions (e.g., Microsoft Word's formatting tools)

It is not necessary to document the use of AI for the permitted purposes listed above. If you have questions about a specific use of AI that isn't listed above, please consult your instructor. The use of AI in any other way to complete online assignments will be considered a violation of the academic integrity policy. This policy ensures that student voices and ideas are prioritized and authentically represented, maintaining the integrity of the work produced by students while allowing basic support to enhance clarity, correctness, layout, and flow of ideas. The goal of adopting a limited use of AI is to help students develop foundational skills in writing and critical thinking by practicing substantive content creation without the support of AI.