

DEPARTMENT OF GEOGRAPHY AND ENVIRONMENTAL STUDIES

Global Biogeochemical Cycles GEOG 4017 [0.5 credit] Winter 2023

Meeting Dates: Jan 09 to Apr 12, 2023 **Days:** Mon, Wed **Time:** 10:05 - 11:25

Building: Southam Hall **Room:** 507

Instructor: Elyn Humphreys, <elyn.humphreys@carleton.ca>

Office hours: Please email me to make an appointment.

1. Course description:

Processes that control the fluxes and reservoirs of biologically active chemical constituents on land, in the atmosphere, and in the oceans. Interactions between biogeochemical cycles and the Earth's climate; impact of land use and fossil fuel emissions on biogeochemical cycles and global change.

2. Prerequisites: none

3. Texts:

Assigned readings will be available via the library (online) and Brightspace

Lecture slides will be made available through 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).

4. Course Schedule:

Each week will generally consist of a formal 80 min lecture and an 80 min student-led discussion reviewing journal articles and a biogeochemistry topic “in the news”.

Tentative schedule:

- Jan 9:** Lecture 1. Introduction/ Global Biogeochemistry
- Jan 11:** Lecture 2. The Global C Cycle
- Jan 16:** Lecture 3. Carbon Cycle – The Carbon Cycle of Terrestrial Ecosystems
- Jan 18:** Discussion Paper and topic in the news (Instructor presentation/student participation)
- Jan 23:** Lecture 4. Carbon Cycle - Soil Carbon and Global Change
- Jan 25:** Discussion Papers
- Jan 30:** Lecture 5. Methane part 1
- Feb 1:** No Class
- Feb 6:** Discussion Papers
- Feb 8:** Lecture 6. Methane part 2
- Feb 13:** Discussion Papers - *Take-home midterm assigned Feb 13, due electronically by 4pm Feb 24-10 am Feb 27*
- Feb 15:** Lecture 7. Aquatic carbon – part 1
- Feb 20/22:** Reading Break
- Feb 27:** Discussion Papers

Mar 1:	Lecture 8. Aquatic carbon – part 2
Mar 6:	Discussion Papers
Mar 8:	Lecture 9. Intro to N Cycling
Mar 13:	Discussion Papers
Mar 15:	Lecture 10. Nitrogen Cycling– part 1
Mar 20:	Discussion Papers
Mar 22:	Lecture 11. Nitrogen Cycling– part 2
Mar 27:	Discussion Papers
Mar 29:	Lecture 12. Nitrogen Cycling– part 3- Take-home final assigned
Apr 3:	Discussion Papers (if needed)
Apr 5:	No Class
Apr 10:	No Class
Apr 12:	(Friday Schedule, no class) <i>Final assignment due electronically by 4 pm</i>

5. Course Evaluation:

35%	Presentations
15%	Participation in class discussions
25%	Midterm assignment
25%	Final assignment

Paper presentations (20%): Each student will be responsible for leading a ~16-20 minute discussion of the papers they are assigned. This entails an introduction to the paper and its context, the scientific questions asked, the important findings and conclusions and the points of debate (e.g., contradictions with other results etc.). At least 3 days prior to presenting the papers in class, 2-3 discussion questions on the papers must be submitted to the instructor. These questions will be disseminated via Brightspace to the rest of the class to focus their reading of the papers.

‘Biogeochemistry in the news’ (15%): Each student will have ~8-10 minutes to present a biogeochemistry topic in the mainstream news (must be from the past 5 years) relevant to the current lecture set. The presentation will include a summary of the news article and a synthesis of the primary literature of the subject area with the goal of interpreting the news article critically.

Participation: All students are expected to read all the papers/articles reviewed each week and contribute to the discussion and participate during in-class activities.

Midterm and Final assignments: Students may discuss their work but all answers must be written by the individual acting alone. Do not edit or otherwise proofread another student’s submission.

Assignments will be submitted online. For each day late, 10% will be deducted per day. Extensions may be granted for legitimate compassionate reasons. Please arrange for an extension BEFORE the deadline. Assignments will not be accepted for grading after graded assignments are returned.

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.

6. Statement on Plagiarism:

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, art works, 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;
- 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; and
- failing to acknowledge sources through the use of 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 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 or even suspension or expulsion from the University.

7. Statement on Student Mental Health

As a University 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. Here is a list that may be helpful:

Emergency Resources (on and off campus): <https://carleton.ca/health/emergencies-and-crisis/emergency-numbers/>

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: (613) 238-3311 or TEXT: 343-306-5550, <https://www.dcottawa.on.ca/>
- Mental Health Crisis Service: (613) 722-6914, 1-866-996-0991, <http://www.crisisline.ca/>
- Empower Me: 1-844-741-6389, <https://students.carleton.ca/services/empower-me-counselling-services/>
- Good2Talk: 1-866-925-5454, <https://good2talk.ca/>
- The Walk-In Counselling Clinic: <https://walkincounselling.com>

8. Statement on Pandemic Measures

It is important to remember that COVID is still present in Ottawa. The situation can change at any time and the risks of new variants and outbreaks are very real. There are [a number of actions you can take](#) to lower your risk and the risk you pose to those around you including being vaccinated, wearing a mask, staying home when you're sick, washing your hands and maintaining proper respiratory and cough etiquette.

Feeling sick? Remaining vigilant and not attending work or school when sick or with symptoms is critically important. If you feel ill or exhibit COVID-19 symptoms do not come to class or campus. If you feel ill or exhibit symptoms while on campus or in class, please leave campus immediately. In all situations, you should follow Carleton's [symptom reporting protocols](#).

Masks: Masks are no longer mandatory in university buildings and facilities. However, we continue to recommend masking when indoors, particularly if physical distancing cannot be maintained. We are aware that personal preferences regarding optional mask use will vary greatly, and we ask that we all show consideration and care for each other during this transition.

Vaccines: While proof of vaccination is no longer required to access campus or participate in in-person Carleton activities, it may become necessary for the University to bring back proof of vaccination requirements on short notice if the situation and public health advice changes. Students are strongly encouraged to get a full course of vaccination, including booster doses as soon as they are eligible and submit their booster dose information in [cuScreen](#) as soon as possible. Please note that Carleton cannot guarantee that it will be able to offer virtual or hybrid learning options for those who are unable to attend the campus.

All members of the Carleton community are required to follow requirements and guidelines regarding health and safety which may change from time to time. For the most recent information about Carleton's COVID-19 response and health and safety requirements please see the [University's COVID-19 website](#) and review the [Frequently Asked Questions \(FAQs\)](#). Should you have additional questions after reviewing, please contact covidinfo@carleton.ca.

9. Requests for Academic Accommodations

Please include the following text, provided by Equity and Inclusive Communities, on all course outlines, and read it at the beginning of your first few classes to remind students. For details, see the [accommodations section](#) and the [Course Outline Information on Academic Accommodations](#).

ACADEMIC ACCOMMODATION

You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

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 accommodation regarding a formally-scheduled final exam, you must complete the Pregnancy Accommodation Form ([click here](#)).

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 [click here](#).

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).

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 where 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: <https://carleton.ca/equity/sexual-assault-support-services>

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 will be provided to students who compete or perform at the national or international level. 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. <https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf>