PGEOG 25000- Winter 2024
The Carbon Cycle
GEOL 38343-W01
(16606)

PROFESSOR RUTBERG CONTACT INFORMATION:

Office Virtual Zoom
E-mail rrutberg@hunter.cuny.edu (*)
Tel. 212-772-5326
Office Hours: Following class and by appointment

* **Note**: the best way to contact m is via email: (1) You must include the course name or number in your subject line. (2) You must include your entire name as it appears in CUNYfirst in your email. We will try to answer all emails within 24 hours. Allow for a 48 hour delay on the weekends.

> ***Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice. Updates will be posted regularly on BlackBoard.***

PREREQUISITES
Departmental approval

REQUIRED TEXTBOOKS
The Carbon Cycle, by David Archer
This book has been ordered at the Hunter College bookstore

ADDITIONAL READINGS will be provided
**this list may be updated prior to course start date

COURSE DESCRIPTION AND OBJECTIVES
This course will describe the carbon cycle on Earth. Students will gain a broad overview of carbon cycling and then read peer-reviewed journal articles to gain an understanding of key processes and the scientific techniques used in this area of research. Topics will include the quantification of the modern carbon cycle, the role of the oceans and terrestrial biosphere in the carbon cycle, carbon emissions projections, carbon footprint calculations and mitigation strategies.

The four main objectives of this course are:

1. To further your understanding of the carbon cycle and apply "systems thinking" in the context of the Earth system and carbon.
2. To introduce students to new ideas about carbon cycling, impacts and mitigation strategies.
3. To further develop data analysis skills, writing and presentation skills so that students can understand clearly communicate scientific concepts and processes.

4. To introduce tools and methods to estimate carbon emissions and carbon footprints.

EXPECTED LEARNING OUTCOMES

At the end of the semester, you will be expected to be able to:

- Describe the major components and fluxes of the carbon cycle and its role in the Earth's climate
- Describe the important controls on the geologic scale, millennial scale and human scale.
- Synthesize contemporary literature to explain the role of the ocean and terrestrial biosphere in the modern carbon cycle.
- Synthesize contemporary literature to understand viable carbon capture/mitigation strategies to decrease atmospheric CO_2
- Use simple web-based calculators to investigate atmospheric carbon projections and carbon footprints.

At the end of the semester, you will also be able to:

- Explain graphs and charts in detail
- Perform basic calculations to quantify fluxes in the carbon cycle
- Gain confidence reading peer-reviewed articles
- Write/present clearly and concisely to communicate scientific concepts and processes.

CLASS MEETG SCHEDULE:

1-1:15 Intro to material
1-3 PM independent reading, group work, social annotation
3-4 PM lecture, question and answer session, student presentations

GROUP WORK

Group is also very encouraged for problem sets and class work.

GRADES

The emphasis of this class is on learning, not grades. To that end, I will provide as much feedback as possible and you will incorporate that feedback to improve your knowledge, communication and quantitative skills. I will be using Gradescope and will be sending instructions for you to establish an account.

Your final grade will also include your intellectual growth and progress over the course of the semester.

Readings and Social Annotation	40%
In class participation	30%
Assignments	10%
Independent project	10%
Assessment(s)	10%

Up to an extra 5% for outstanding class participation (contributions to live discussions and/or comments on Voicethreads/Discussion Boards)

Assessment(s)

Students will be expected to demonstrate mastery of the material and the ability to synthesize key concepts. Exams will be online and open book.

About examinations and grades:

a) Grades follow Hunter's grading system: http://catalog.hunter.cuny.edu/content.php?catoid=15&navoid=1433. Grades will be curved at my discretion.
b) Your exams must be written legibly using complete sentences, spelling and proper grammar. If you have a hand writing issue, practice. I cannot grade what I cannot read.
c) Make-up exams are ONLY available in extreme cases, and students must provide documentation of the reason for missing the exam (medical or other forms)
d) I will automatically agree to the CR/NC option ONLY if the conditions stated in the CR/NCR form are satisfied: all course work has been completed and you earned grades such that you accumulate at least 50 points total in the course (this includes labs plus exams plus extra, if you earned any). Students on probation are not eligible for this option. Students must see me during office hours before the last day of class to discuss this option. Requests for CR/NC as a final grade will not be accepted during or after the final exam.

Assignments: Assignments will be largely based on synthesizing concepts learned through readings and lectures, data interpretation and basic calculations that will be taught in class.
Group work is also very encouraged for all assignments.
When you upload assignments to BB or Gradescope, the document name must have the following format:

Lastname_firstname_assignmentname_CC_2024.doc
Examples:
Rutberg_Randye_HW#1_CC2024
Rutberg_Randye_HW#2_CC2024

This naming rubric helps me keep track of student work. If you do not name your documents as specified above, I do not guarantee that they will be graded.

In addition, within the document itself, you must include your full name, assignment title and any other students with whom you worked.

Voicethread Assignments: Voicethread assignments will be used to discuss key diagrams and concepts. Examples and rubrics will be provided to guide your efforts

Group Projects: The group project will be designed around synthesizing key concepts and exploring data.

Tardiness in handing in assignments This class is on an accelerated schedule. I will try to be reasonably flexible with assignments but I do not have much leeway. Please plan to turn in assignments on time.

Classroom policies: You are expected to make a genuine effort to read the assigned materials. We will be using tools that allow for social annotation and interaction so that students can help one another with challenging concepts. Students are expected to arrive prepared with questions and insights to the synchronous portion of the class.
The professor reserves the right to alter or add topics and assignments as needed.

Classroom policies: Please make every effort to turn your camera on during class meetings.

I reserve the right to alter or add topics and assignments as needed.

ATTENDANCE
I will take attendance daily. You will enjoy the course and learn more if you attend class regularly. In addition, please turn off your mail, texts and other distractions during class if you want to master the material.

HELPFUL INFORMATION

My Teaching Philosophy: My goal in teaching is to help you become confident and responsible professionals and to make this experience an enjoyable one. My approach to teaching involves being a facilitator in the learning process as opposed to being the authoritarian lecturer at the front of the room with a "one-way information transfer" style. I understand and respect individual differences in learning and do my best to promote learning in the classroom by working with individual differences rather than against them. At the same time, I wish to impart technical skills and a sense of responsibility by encouraging you to play the role of professionals in the classroom.

I expect you to put your best effort in this course. This involves participating in the in-class exercises, reading the assigned material, doing the homework, editing when necessary until they are clear and correct, and preparing for quizzes and exams.

Lecture: You should plan on spending the assigned class time on this course. The course is designed to take the full 3 hours per day assigned.

Finally: It is important to start with a good study habit. Consistency is the key. Forming study groups is extremely helpful. Use my time and any resources available to you throughout the semester. Make progress steadily as the material in this course cannot be understood the night before the exam. Concentrate on understanding rather than 'regurgitating'. Put out your best effort every day!

The following are useful tips to do well in this or any class:

- Attend class and take detailed notes.
- Read the assigned material in the text (or other) ***before*** coming to class.
- Re-write your notes as soon as possible after class. This will allow you to fill in the details still fresh in your memory, and prepare questions for the next time the class meets.
- Test yourself by answering the questions in the book and in class.
- Carefully study the diagrams and charts in the book and in the lectures.

- Read the rubrics associated with the assignments so that you understand the expectations.

As with all courses at Hunter College:

Hunter College Policy on Academic Integrity
Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. See the following report by the Hunter College Senate for more details: http://www.hunter.cuny.edu/senate/assets/Documents/Hunter%20College%20Policy%20on%20Academic%20Integrity.pdf

ADA Policy
In compliance with the American Disability Act of 1990 (ADA) and with Section 504 of the Rehabilitation Act of 1973, Hunter College is committed to ensuring educational parity and accommodations for all students with documented disabilities and/or medical conditions. It is recommended that all students with documented disabilities (Emotional, Medical, Physical, and/or Learning) consult the Office of AccessABILITY, in Room E1214B, to secure necessary academic accommodations. For information and assistance: (212)772-4857 or (212)650-3230.

Hunter College Policy on Sexual Misconduct
In compliance with the CUNY Policy on Sexual Misconduct, Hunter College affirms the prohibition of any sexual misconduct, which includes sexual violence, sexual harassment, and gender-based harassment retaliation against students, employees, or visitors, as well as certain intimate relationship. Students who have experienced any form of sexual violence on or off campus (including CUNY-sponsored trips and events) are entitled to the rights outlined in the Bill of Rights for Hunter College.

A. Sexual Violence: Students are strongly encouraged to immediately report the incident by calling 911, contacting NYPD Special Victims Division Hotline (646-610-7272) or their local police precinct, on contacting the College's Public Safety Office (212-772-4444)
B. All Other Forms of Sexual Misconduct: Students are also encouraged to contact the College's Title IX Campus Coordinator, Dean John Rose (jtrose@hunter.cuny.edu or 212-650-3262) of Colleen Barry (colleen.barr7@hunter.cuny.edu or 212-772-4534) and seek complimentary services through the Counseling and Wellness Services Office, Hunter East 1123.

CUNY Policy on Sexual Misconduct Link: http://www.cuny.edu/about/administration/offices/la/Policy-on-Sexual-Misconduct-12-1-14-with-links.pdf

Preferred Gender Pronoun

All people have the right to be addressed and referred to in accordance with their personal identity. In this class, we will have the chance to indicate the name that we prefer to be called and, if we choose, to identify pronouns with which we would like to be addressed. I will do my best to address and refer to all students accordingly and support classmates in doing so as well.

A Tentative Syllabus is provided below – an updated version will be available at the beginning of the semester from the course website and blackboard (look for file schedule.pdf). Syllabus gets updated throughout the semester, as needed. Check regularly for updates.

TENTATIVE COURSE SCHEDULE
The Carbon Cycle – Winter 2023
Department of Geography, Hunter College

Week 1: All Chapters in the Carbon Cycle, by David Archer

Week 2: Key Papers about the modern Carbon Cycle:
- Papers 1 TBD
- Paper 2 TBD
- Paper 3 TBD
- Paper 4 TBD
- Group 1 synthesis
- Group 2 synthesis

Week 3: Mitigation Strategies
- Paper 1 TBD
- Paper 2 TBD
- Paper 3 TBD
- Paper 4 TBD
- Use of web tool to understand future carbon emissions
- Use of web tool to calculate carbon foot print

Week 4: Carbon estimations and course wrap up

Date	Topic	Reading/social annotation	Other material	Assignment
1/2/2024	Intro to the Class and The Carbon Cycle on Earth	Chapters 1-2, Archer	Podcast 1	Podcast comment (mentimeter)
1/3/2024	The Ice Age and Future Carbon cycle	Chapters 3-4, Archer	Podcast 2	Podcast comment (mentimeter)
1/4/2024	Methane and Summary	Chapters 5-6, Archer	Podcast 3	Podcast comment (mentimeter)
1/8/2024	The Modern Carbon Cycle – overview paper	TBD	Podcast 4	Podcast comment (mentimeter)

1/9/2024	The terrestrial biosphere	TBD	Podcast 5	Podcast comment (mentimeter)
1/10/2024	Marine carbon	TBD	Podcast 6	Podcast comment (mentimeter)
1/11/2024	The fate of fossil fuel CO2	TBD	Podcast 7	Podcast comment (mentimeter)
1/16/2024	Carbon mitigation strategies	TBD	Podcast 8	Podcast comment (mentimeter)
1/17/2024	Carbon mitigation strategies	TBD	Podcast 9	Podcast comment (mentimeter)
1/18/2024	Group work: Exploration of simulations to limit future carbon emissions	In class presentations	Podcast 10	Podcast comment (mentimeter)
1/22/2024	Group work: estimating carbon footprints	In class presentations	Podcast 11	Podcast comment (mentimeter)
1/23/2024	Course wrap up	Collaborative key Concept Summary	Assessment	