Global Climate Change
PGEOG 36100/73200
Tuesday & Friday 11:30 am – 12:45 pm @HN1022

Professor Haydee Salmun
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Office location: Hunter North room 1035 (10th floor)
Email (preferred means of contact: **hsalmun@hunter.cuny.edu**. Please (1) include the course name; (2) include your entire name. I try to answer all emails within 24 hours. Allow for a 48 hour delay on the weekends.
Office Location: 1035 Hunter North
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Office Hours: Tuesday: 3:00 pm – 4:00 pm; ***in person @ Room HN1035.***
Tuesday: 4:00 pm – 5:00 pm; ***virtual (zoom) by appointment***

DIVERSITY & INCLUSION

I am committed to fostering an intellectual environment that is enriched and enhanced by diversity in all dimensions, including race, ethnicity and national origins, gender and gender identity, sexuality, class and religion. I am especially committed to increasing the representation of those populations that have been historically excluded from participation in U.S. higher education in STEM fields. It is my hope that we can work together and collectively move closer to accomplish that objective.

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.

COURSE OVERVIEW

This course will describe the physics and some chemistry of the earth's climate system. It will also focus on factors that perturb the earth's climate and the range of responses of the Earth's climate system. Long, medium and short term climate variability and methodologies employed to study the Earth's paleo- and modern climate will be described and discussed. An ongoing discussion about modern climate change and recent weather patterns and events will take place throughout the course. Students will be expected to complete read scientific journal articles, complete (quantitative-based) short assignments complete a research project and participate in the class discussions.

Course Objectives

The overall objective of this course is to develop students' understanding of the Earth's climate system and the factors and feedbacks that influence global climate change on multiple time scales. A specific objective is to educate students about the consequences of modern climate change and provide the conceptual and technical skills that can be used in developing potential mitigation strategies. To accomplish these objectives, the course will provide

- a broad foundational knowledge of the basic physics of the Earth's climate system;
- a well-developed understanding of the Earth's climate history and the forcings and feedbacks that contribute to climate change on different timescales;

- an understanding of modern, human driven climate change and its consequences;
- an understanding of the tools and methodologies used by scientists to study the Earth's climate system.

The course is roughly structured along three themes or units: (1) Earth's Past Climate and Climate variations, (2) Present (modern) Earth's Climate and (3) Future Climate and Climate Change. Each unit will have corresponding lectures, exercises, additional readings and discussions. This structure is designed to achieve the expected **LEARNING OUTCOMES** listed below.

Class exercises, readings and projects will be dedicated to an in-depth understanding the topics discussed in lectures, and to develop basic skills in the use of 'facts' and data for predictions of future climate change.

EXPECTED LEARNING OUTCOMES

1. Identify and apply the fundamental concepts of physics, chemistry, geology, biology, and mathematics to the study of the earth's climate.
2. Gather, interpret, and assess information from a variety of sources and points of view.
3. Evaluate evidence and arguments critically and analytically.
4. Articulate and evaluate the empirical evidence supporting a scientific or formal theory:
5. Understand the scientific principles underlying matters of policy and public concern as they relate to climate and climate science.
6. Produce well-reasoned written arguments using evidence to support conclusions.

REFERENCE TEXT BOOKS

There is no textbook required for this class. We will make use of Open Access Sources, a list of which can be found on our Blackboard page.

Earth's Climate Past and Future, 2nd ed., William F. Ruddiman. W.H. Freeman, 2007 ISBN-13: 978-0716784906

The two books listed below are about climate, written by experts in the field, are highly recommended. Materials from these books will be used (and provided) in class when appropriate.

The Carbon Cycle by David Archer, Princeton University Press, 2012, ISBN-10: 0691144141

The Climate Crisis. An Introductory Guide to Climate Change by David Archer and Stefan Rahmstorf, Cambridge University Press, 2010, ISBN 978-0-521-73255-0 (Paperback)

Additional readings (articles, websites etc.) will be provided throughout the semester.

Blackboard will be routinely used to make announcements, distribute reading materials so make sure that you regularly check for updates.

GRADING METHOD AND SCALE

Grades will be based on class participation, homework assignments, two mid-term exams and one final exam. A detailed description of the Hunter College Grading System may be found at http://catalog.hunter.cuny.edu/content.php?catoid=23%navoid=3149.

Your grade for the course will be based on two mid-term exams (20% each), class participation (20%), homework assignments (30%) and a final paper reporting on class projects (which includes an in-class short presentation) (30%).

EXAM GUIDELINES AND POLICIES

Exams will be based on assigned readings of journal articles, materials covered in class and case studies (when applicable). Dates are **CLEARLY** posted on the Course Calendar and Content. Examinations are 1 hour and 15 minutes. No electronic devices or reference materials will be permitted on the desk during exams unless specified. Make-up exams are ONLY available in extreme cases, and with medical (or other) forms that confirm the absence.

Exams are designed to evaluate a student's ability to master content, integrate themes and concepts between sub-disciplines that contribute to climate studies, understand the usefulness and limitations of climate data for studying processes, and apply logical arguments to support perspectives.

P/NC POLICY

The P/NC option will be honored only if the conditions stated on the P/NC 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. For more information about requesting a P/NC option and the required conditions see https://hunter.cuny.edu/students/registration/register-for-classes/credit-no-credit/.

ATTENDANCE AND CLASSROOM POLICIES

Class participation constitutes 20% of the final grade. Although attendance is not mandatory as specified by Hunter College, this course will consider attendance as contributing to the final grade. Therefore, attendance is strongly encouraged at all lectures. Students who do not attend lecture cannot participate in class discussions, class short questions the professor asks to gauge participation and progress in the class, and low impact short exercises, all of which must be done 'in person'. All students are expected to abide by the following policies when in lecture in order to provide a more respectful and productive learning environment.

- All cell phones must be silenced.
- Laptops are permitted for note taking purposes only.
- Texting and other non-class related smart phone activities are not allowed. Students should quietly excuse themselves from the lecture if substantial external electronic communication is required.

ADDITIONAL HELPFUL INFORMATION

My Teaching Philosophy: My goal in teaching is to help students in becoming 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 quantitative and analytical skills and a sense of responsibility by encouraging students to play the role of professionals in the classroom.

I expect students to put their best effort in this course. This involves participating in the in-class exercises, reading the assigned material, working out in-class assignments and other projects, editing text when necessary until it is clear and correct, and preparing for quizzes and exams.

Finally: It is important to start with a good study habit. Consistency is the key. Forming study groups is extremely helpful. Use my office hours and any other resource 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.

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 CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures.

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, located in Room E1214B, to secure necessary academic accommodations. For further information and assistance, please call: (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-biased harassment retaliation against student, 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, or contacting the College's Public Safety Office (212-772-4444)

B. ***All other forms of sexual misconduct***: Students are strongly encouraged to contact the College's Title IX Campus Coordinator, Dean Jean Rose (jtrose@hunter.cuny.edu or 212-650-3262) or Colleen Barry (colleen.barr7@hunter.cuny.edu or 212-772-4534) and seek complementary 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-link.pdf

**** A detailed schedule of classes, topics and reading assignments will be updated regularly and made available on Blackboard ****

*** INITIAL (TENTATIVE) SCHEDULE ***

Week #	Date	Unit/Topic
1	Fri 8/25	Syllabus & Introduction to the Class
2	Tu 8/29	**U1:** Introduction to Climate Science – An Overview
	Fri 8/31	**U1:** Introduction to Climate Science – Basic Concepts
3	Tu 9/5	**U1:** Introduction to Climate Science – Global Energy Balance **Assignment 1**
	Fri 9/8	**U1:** Introduction to Climate Science – Radiative Forcing
4	Tu 9/11	**U1:** Introduction to Climate Science – Dynamics.
	Fri 9/15	**No classes at Hunter today**
5	Tu 9/19	**U1:** Introduction to Climate Science – Importance of the
	Fri 9/22	**Class Project:** Topics, definition & draft outline **Assignment 1 due** **Assignment 2**
6	Tu 9/26	**U1:** Introduction to Climate Science – Climate Models
	Fri 9/29	**U1:** General Circulation Models
7	Tu 10/3	**Exam 1**
	Fri 10/6	**U1:** General Circulation Models
	Tu 10/10	**No class today – Hunter's Monday schedule**
8	Fri 10/13	**Class Project**: Update on Progress & First Draft Outline **Assignment 2 due**
9	Tu 10/17	**U2**: CO_2 & Long-term Climate **Assignment 3**
	Fri 10/20	**U2**: Mechanisms of long-term climate change
10	Tu 10/24	**U2**: Mechanisms of long-term climate change
	Fri 10/27	**U2**: Greenhouse Climate
11	Tu 10/31	**Class Project**: Discussion of Class Project work & updates
	Fri 11/3	**U2**: Greenhouse Climate
12	Tu 11/7	**U2**: From Greenhouse to Icehouse
	Fri 11/10	**U2**: From Greenhouse to Icehouse **Assignment 3 due**
13	Tu 11/14	**Exam 2**
	Fri 11/17	**Class Project**: Updates on Class Project work **U3**: Current research in climate science
14	Tu 11/21	**U3**: Current research in climate science

	Fri 11/25	**Thanksgiving Recess**
15	**Tu 11/28**	**U3**: Current research in climate science
	Fri 12/1	**Students' Class Project Presentations**
16	**Tu 12/5**	**Students' Class Project Presentations**
	Fri 12/8	**Students' Class Project Presentations**
	Tu 12/12	**Reading Day**
Final Exam Period: Thursday 12/14 – Wednesday 12/20		