GEOL 20500
ENVIRONMENTAL GEOLOGY
Mode of instruction: In-person Web-enhanced
Mondays and Thursdays 10.00 am to 11.15 am
Hunter North, Room 1022
Spring 2023

Instructor: Dr. Shruti Philips
Office: HC North, Room 1044
Office Hours: *Mondays and Thursdays 1.30 to 2.30 or by appointment*
E-mail: sph0001@hunter.cuny.edu (communications to me must have GEOL 205 in the subject line and you must sign your full name as it appears in CUNYFirst.)
Department of Geography and Environmental Science Office: Rm 1006 HN, Phone: 212-772-5265

Introduction:

The main objective of this course is to give you an understanding of the interactions between humans and the geologic processes that shape your environment. As the human population continues to grow, resource depletion and hazards will become more severe. Many decisions concerning our use of resources, such as water, soil, minerals, energy, and space to live, will determine our standard of living and the quality of our environment. Scientific knowledge, combined with our values, will dictate these decisions.

This course examines not only the way geological processes operate and impact society, but also how the Earth system responds to human activity. The difficult problems associated with extracting enormous quantities of resources needed to sustain modern societies will be discussed. We will also address ways we can minimize the risks associated with hazardous earth processes. Quantitative analysis of selected topics will also be introduced to provide a deeper understanding of the complexity of today's environmental issues.

Basic material covered in the course includes:

- Fundamental concepts and scientific methods
- Earth structure, materials, and processes
- Hazardous earth processes such as *earthquakes, volcanic eruptions, floods, landslides, and coastal erosion*; their impact and mitigation
- Study of resources such as *soils, water, minerals, and energy*
- Study of practical environmental issues such as *groundwater contamination, landfill siting, and shoreline property assessment*
- Quantitative analysis of topics such as *earthquakes, rock and soil mechanics, soil salinity, landslide potential of slopes and groundwater flow*
- Carbon sequestration

This course is designed to produce the following **learning outcomes**:

- You will apply the fundamental concepts of the plate tectonics theory and the rock cycle to understand how geologic processes operate.

- You will describe and discuss the impacts of hazardous geologic processes such as earthquakes, volcanoes, floods, landslides, and coastal erosion.
- You will identify and discuss various geologic resources such as rocks, minerals, soils, water, and energy and analyze the environmental impact of resource extraction.
- You will apply the scientific method to analyze and interpret geologic data to solve environmental problems associated with earthquakes, volcanoes, landslides, floods, groundwater contamination, landfill siting, soil quality, rock strength, and shoreline property evaluation.

This is a **3-hr**, **3.0-credit**, science-based course, which fulfills **GER 3/B**.
Prerequisite: GEOL 10100

Required reading:

- Keller, Edward A., **Introduction to Environmental Geology**, 5th Ed., 2012, Prentice Hall (paperback) ISBN: 978-0-321-72751-0. *A copy of this book is available at* ***the reserve desk*** *of the Hunter College library.*

- **Hazard City for Modified Mastering Geology** 5th Edition –Pearson, *$19.99 details on Blackboard on how to purchase access code.*

Course Structure:
This course will be taught in-person on the Hunter College campus. The **Hunter College Blackboard** site will have a **"Weekly coursework"** page. For each topic there will be folder labelled by topic containing recommended reading, additional articles, and associated assignment and/or other materials. Students are expected to check the site regularly and keep up with the material.
Quantitative assignments will be discussed and begun in the classroom and completed at home.

Assessment and Grading Policy: There will be a **midterm** exam given during the semester and a **final** exam at the end of the semester. Exams are based on lecture, assigned readings, films shown in class and text material and usually include multiple-choice and short-answer type questions. Exams will not be cumulative. Grades follow the Hunter College grading system:
http://catalog.hunter.cuny.edu/content.php?catoid=15&navoid=1433

Attendance: Students are urged to attend ***all*** classes. ***There is a direct correlation between good grades and good attendance.*** All students are responsible for work covered in their absence.

Midterm	**30%**
Final	**30%**
In-class/Homework Assignments	**30%**
Group presentation	**10%**

Group Presentation:
You will work with a small group (MAX 4 students) to prepare an **oral presentation** on a topic relevant to the syllabus. **A range of topics will be provided** for students to choose from, and group arrangement will be determined by the instructor in consultation with the students. Students in each group should make an appointment to meet with me at least **once** during the development of the project and set time to meet at least **twice** with one another as a group to prepare the presentation. Each presentation will be approximately **10 minutes long**. Further details will be provided in class.

Tips for getting good grades: ***The more time you put in, the better your grade will be.***

- 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.

Additional reading: Keep abreast of news stories related to topics discussed in class. Articles may be found in the science section of *The New York Times* (Tuesday), magazines such as *National Geographic, Scientific American, Discover, etc. or online sources such as New Scientist, Science Daily, NASA's Earth Observatory, BBC News–science-nature,* etc.

Classroom Etiquette: Conversation during class and walking in and out of the room is disruptive and must be kept to a minimum. Please keep eating and drinking to a minimum.

Cell Phone Policy: Out of respect for preserving a positive learning environment, all cell phones, beepers, and other portable noise-making devices must be SILENCED for the duration of the class period.

CUNY grading policy:

- Your grades will be assigned based on the CUNY grading policy that can be found in the online undergraduate catalog that can be found at http://catalog.hunter.cuny.edu/content.php?catoid=15&navoid=1433
- **Pass/No Credit Option:**
  You have the option to request a grade of Pass/No Credit for this course. To receive this grade, you must submit the request for a Pass/No Credit grade by completing the form linked to the registrar's website (https://hunter.cuny.edu/students/registration/register-for-classes/credit-no-credit/#instructions). The form must be submitted by 11:59 pm the day before the last day of classes. The decision is irrevocable. To qualify for a Pass/No Credit grade, you must complete all the requirements for the course, including attendance, assignments, exams, and the final exam/project. To Pass, you must earn at least a D. If you stop attending, stop submitting assignments, and/or do not take the final exam, you receive a grade of **WU (Unofficial Withdrawal),** which cannot be converted to Pass/No Credit, and may affect your financial aid status.

- Pursuant to CUNY policy, an **Unofficial Withdraw (WU)** is assigned to students who **attended a minimum of one class**. It is important to understand the definition of a WU and the difference between this grade and an **F** grade. The conditions for assigning the WU grade include:
  1. A student's enrollment has been verified by the course instructor, and
  2. The student has *severed all ties* with the course *at any time before the final exam week* and, consequently, has *failed to complete enough course work*, as specified in the course syllabus, to earn a letter grade, and
  3. The student has *not officially withdrawn* from the course by completing the process for a W grade, or made arrangements to receive an INC.
- For an **IN** to be awarded you must contact me about making up the exam and fill out the *'Contract to Resolve an Incomplete Grade'* form **within 72 hours** of the day/time of the final exam. An unresolved IN becomes a FIN at the end of the following semester.

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. 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

Diversity and 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. 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.

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-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) or Colleen Barry (colleen.barry@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

Schedule of class sessions on the next page….

Tentative Syllabus for Spring 2023

Dates	Topic	Chapter
Th 1/26	INTRODUCTION	1
M 1/30	Fundamental concepts	
Th 2/2	Earth Processes	2
M 2/6	Earth Processes	
Th 2/ 9	Earthquakes	6
Th 2/16	Earthquakes, Tsunami	7
Tu 2/21	Stress Triggering Hypothesis,	readings
Th 2/23	Seismic Engineering **(Earthquake Hazard quantitative exercise)**	
M 2/27	Volcanic Activity	8
Th 3/2	Volcanic Activity	
M 3/6	Earth materials: Minerals	3
Th 3/9	Earth materials: Rocks	
M 3/13	Rock Mechanics	
Th 3/16	**MIDTERM EXAMINATION**	
M 3/20	Soils and the environment	17
Th 3/23	Soils and the Environment	
M 3/27	Soils and the Environment **(Soil Quality exercise)**	readings
Th 3/30	Landslides	
M 4/3	Landslides **(Landslide Hazard quantitative exercise)**	10
SPRING BREAK		
M 4/17	Rivers and Flooding	
Th 4/20	Rivers and Flooding	9
M 4/24	Water resources **(Darcy's Law - Groundwater flow quantitative exercise)**	
Th 4/27	Water resources	13
M 5/1	Coastal processes	
Th 5/4	Coastal processes	11
M 5/8	Mineral Resources	15
Th 5/11	Energy Resources; Carbon Sequestration **(All Hazard City Assignments due)**	16
M 5/15	**Group presentations**	
TBA	**FINAL EXAMINATION**	

- Classroom assignments will often include quantitative analysis. You are expected to always have on hand a **scientific calculator, metric ruler, pen, and pencil**.
- Classroom assignments will be graded weekly. Answers must be in full sentences. If calculations are expected, show your work. The grading will be as follows: **5= excellent, 4= good, 3= fair, 2= poor, 1= attendance, 0= not handed in.** You will automatically lose points if your work is sloppy or incomplete. [If you are absent, but handed in the work, you can get a maximum of 4 points.]

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. Any changes to the syllabus will be posted on Blackboard.