GEOL 20500
ENVIRONMENTAL GEOLOGY
Mode of instruction: Web-Enhanced
Tuesdays and Fridays 9.45 to 11.am
Hunter North, Room 1021
Spring 2018

Instructor: Dr. Shruti Philips
Office: HC North, Room 1032
Office Hours: *Mon and Thurs 12.30-1pm 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 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 *population growth, 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.
- You will analyze and critique research articles that discuss new solutions to current environmental problems.

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.

- Rutberg, R., and Philips S., **A Literary Companion to Geology**, 1st Ed., 2018, Cognella Academic Publishing ISBN: 978-1-5165-0840-2. To purchase, please follow the instructions below. Video instructions for placing an order and downloading an eBook are available at: https://vimeo.com/195821361.
  1. Visit https://students.universityreaders.com/store/.
  2. Create an account or login if you have an existing account.
  3. Select your state and then your university from the dropdown menu.
  4. Scroll to find your course listing and select your textbook from the list of available course materials. Choose your preferred textbook format. Print Price: $72.95, Digital Price: $65.95

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. These exams will count 25% each for a total of 50% of the grade. The remaining 50% of the grade will be based on **attendance**, **classroom exercises**, **homework exercises** and **readings** for a grand total of 100%.

Midterm → 25%
Final → 25%
Homework and classroom exercises →30%
Readings →15%
Attendance →5%

For ***Extra Credit*** you may submit a **field report** of photographs and descriptions of phenomena related to topics discussed in class, observed directly by you. This will be worth a maximum of 5% added to the total course grade.

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/.

Exam Policy: A 'make up' for the midterm will be given only if you miss it because (1) you are ill and can prove that with a physician's note; and (2) you e-mail me BEFORE the exam and leave your name & phone number at which you can be reached. There will be **no make-ups** for missed quizzes.

- If you **miss the final exam** a makeup will be given only if you inform me within 72 hours of the day/time of the final exam **and** present me with checkable documentary evidence of the reason for your absence--a doctor's note, a bill from the hospital, a note from the funeral home etc. 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 an FIN at the end of the following semester.
- **CR-NCR** grades will be assigned based on the rules outlined on the CR/NCR form and must be submitted no later than 15 minutes before the beginning of the final exam.

Attendance: Attendance will be taken at all class meetings. 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 and must be sure to obtain any hand-out material. Attendance is worth 5% of the course grade which means that if the student is present for 100% of the classes and has only excused

absences, he/she earns the full 5%. The total days present including excused absences will be counted and factored into the grade accordingly. If students are late to class they will only get half the attendance credit.

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 *Earth, National Geographic, Scientific American, Discover, etc. or online sources such as New Scientist, Science Daily, NASA's Earth Observatory, BBC News–science-nature,* etc.

Blackboard: Course documents, hand-out sheets, and useful links will be posted on Blackboard. Announcements and other information will also be posted from time to time, so please check the site regularly. Important: Students should check their Hunter e-mail messages regularly for messages from the instructor.

Classroom Etiquette: Cell phones must be turned off in class. 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.

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

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) of 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

Tentative Syllabus for Spring 2018

Dates	Topic	Chap EG	Read LCG
T 1/30	INTRODUCTION	1	1,14
F 2/2	Fundamental concepts	1	10
T 2/6	***Exercise#1: Population Growth Quantitative analysis (5)***		
F 2/9	Earth Processes	2	3,4,5
T 2/13	Earthquakes	6	9
F 2/16	Earthquakes, Tsunami	6,7	7
F 2/23	Stress Triggering Hypothesis, Seismic Engineering		
T 2/27	***Exercise #2: Earthquakes; + HW: Hazard City/Earthquake damage (10)***		
F 3/2	Volcanic Activity ***Exercise#3 HW: Hazard City/Volcanic Hazard (5)***	8	8
T 3/6	Earth materials: Minerals	3	11
F 3/9	Earth materials: Rocks ***Exercise#4: HW Hazard City Landfill siting (5)***		6
T 3/13	Rock Mechanics		
F 3/16	Soils and the Environment		
T 3/20	Soils and the environment	17	
F 3/23	Soils and the environment		
T 3/27	***Exercise#5 Soil pollution & Soil mechanics Quantitative analysis (5)***		
T 4/10	**MIDTERM EXAMINATION**		
W 4/ 11	Landslides	10	
F 4/13	Landslides ***HW:Exercise#6 Quantitative analysis + Hazard City/Landslide Hazard (10)***		
T 4 17	Rivers and Flooding	9	
F 4/20	Rivers and Flooding ***HW: Exercise#7 Hazard City/Flood insurance rate maps (5)***		
T 4/24	Water resources	13	
F 4/27	Water resources ***Exercise#8 Darcy's Law + Hazard City/Groundwater contamination (10)***		
T 5/1	Water pollution	14	
F 5/4	Coastal processes ***HW: Exercise#9 Hazard City/Shoreline Property assessment (5)***	11	
*T 5/8	Mineral Resources	15	2
F 5/11	Energy Resources	16	12
T 5/15	Carbon Sequestration		13
TBA	**FINAL EXAMINATION**		

- **EG**: Introduction to Environmental Geology; **LCG:** A Literary Companion to Geology
- Classroom assignments will often include quantitative analysis. Students are expected to always have on hand a **scientific calculator, metric ruler, pen and pencil**.
- Classroom and homework 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.]

- *All **reading assignments** are due by this date. You are expected to submit answers to **<u>two</u> discussion questions** from each of **any 10 chapters** from 'A Literary Companion to Geology'. This is worth 15% of your grade.

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.**