

**Environmental Chemistry U6220****Summer 2014**

**Instructor:** Benjamín Carlos Bostick      **Office Hours:** Monday afternoons, or by appointment

**Office:** 433 Comer Geochemistry (LDEO)  
Office hours in IAB 6<sup>th</sup> floor, or elsewhere on campus by appointment.

**Email:** [bostick@ldeo.columbia.edu](mailto:bostick@ldeo.columbia.edu) or [bb2461@columbia.edu](mailto:bb2461@columbia.edu)

**TAs:** Elizabeth Shoenfelt and Quentin O'Brien

**Textbook:** *None, although there are a number of texts in general chemistry and environmental geochemistry that would be good references.*

**Schedule:** Thursdays, 9-12, 403 IAB  
Lab Sessions: LAB A Room: 510A IAB and 411 IAB from 1:00-3:30pm  
LAB B Room: 510A IAB and 411 IAB from 3:30-6:00pm

**Labs:** Each student is required to attend lab **every** week. Many of the laboratory assignments involve group work, so it will be important to go to your assigned lab section. Lab reports are due the following Monday to avoid conflicts with other courses, and to allow time to give feedback for the next report.. Assignments are graded on a point scale from 0-50. No make-ups will be granted. We may have short quizzes at the beginning of the lab based on the previous laboratory; these quizzes are intended to test your understanding, and to provide me with feedback about the course material so that I can best teach you.

**Laboratory Report Submission Deadlines****1. Summer Sessions (May 29 – July 10)**

	Monday	Tuesday	Wednesday	Thursday	Friday
Climatology		■	—————	—————	—————▶
Environmental Chemistry	—————▶			■	—————
Principles of Ecology		—————▶			■
Environmental Policy	—————	—————	—————▶	■	

Black boxes indicate when class is held, and when the assignments are given. Arrows extend for the period allotted for each assignment. Arrowheads indicate the day each assignment is due.

For example, climatology assignments are given on Tuesdays and due on Fridays, environmental chemistry assignments are given on Thursdays and due on Mondays, etc.

**Homework:** The major assignments that will be performed in this course are the laboratory reports, many of which are group projects. We may have additional exercises that are given during the term, but it will not be collected or graded.

**Exams:** There will be one mid-term exam and a cumulative final exam for the lecture portion of the class. Material from lectures, labs and readings will be covered on the mid-term exams and the final. To avoid complicated scheduling, the mid-term exam will be given out during the regular class period of Week 3, done independently, and turn in by email to me within 24 hours. It should not be overly complicated to complete within 1-2 hours and will be of a similar format to that of the final. *The final will be held during the scheduled exam time, which is (I believe) Monday, July 7th, from 1-3 pm in 403 IAB.*

<b>Grading:</b>	Mid-term Exam 1:	20%
	Labs, Assignments, Quizzes:	35%
	Course Project	10%
	Final Exam:	25%
	Participation/Attendance:	<u>10%</u>
		100%

Participation will be based on both attendance and active participation in the lectures, laboratories and field trips. *I also expect to see each of you individually to discuss any questions you have, your progress, and anything else that comes to mind. I maintain a very open door policy, so this should not be overly difficult.* Grading will use the standard 100-90, 80-89, 70-79... grading scale.

**Course Project:** A short course project should be written that examines a research topic in the field of environmental geochemistry. This project should be detailed and show in-depth knowledge and research concerning a *specific* aspect of environmental chemistry. In it, you should identify an environment, the chemistry that is of interest, how humans affect it, the stakeholders that are affected by that chemistry, and suggest a realistic policy-based solution to the problem. It may also contain laboratory or other research pertaining to the system. It should involve the synthesis of at least 5 research papers from primary literature on the subject. No subjects may be duplicated in the class, although this is seldom a problem. **To ensure that reasonable progress is made towards this goal, I expect that each of you will discuss your proposed project topic and your literature search with me by the date of the mid-term exam,** and we will discuss your proposed sources at that (or another) time to ensure that your topic is sufficiently focused and achievable. Sources should be from the primary research literature. I also will be available to consult with you regarding your progress throughout the term. It is best to get started early, as it will both help the quality of the project, and your final grade on it.

**Disabilities:** I encourage students with disabilities to take this course. Any student with a documented disability needs to speak with me during the first week of class to make accommodation for their disability. All discussions will remain confidential, although the Student Disabilities Coordinator may be consulted to verify the documentation of the disability.



## DETAILED SCHEDULE

<b>Week</b>	<b>Lecture (9 am -12 pm)</b>	<b>Laboratory (afternoons)</b>
Week 1. Thursday May 29 <sup>th</sup>	Chemical fundamentals and basic chemistry	Chemistry Review and basic chemical concepts.
Week 2. Thurs., June 5 <sup>th</sup>	The Atmosphere.	Atmospheric lead and its legacy.
Week 3. Thurs., June 12 <sup>th</sup>	The Hydrosphere. Aquatic and water chemistry	The Safe Drinking Water Act. Drinking water standards.
Week 4. Thurs., June 19 <sup>th</sup>	The Geosphere. Geochemistry	Mercury in Estuaries.
Week 5. Thurs. June 26 <sup>th</sup>	The biosphere. Biogeochemistry. <i>Case Study on the biogeochemistry of soils and sediments.</i>	Field Trip to the Gowanus Canal.
Week 6. Monday, June, 30. Lamont-Doherty Earth Observatory Field trip.	Depart 8 am from campus.	
Week 6. Thursday, July 3 <sup>rd</sup>	Detailed Case Study. Arsenic in the Environment, the environmental impacts and potential solutions to the problem. Potential other subjects may also be examined, including ocean productivity and geoengineering solutions to climate change	The Climate Business.
Week 7. Scheduled exam period (Monday, July 7th)	Final. In class exam.	N/A