

# Global Biogeochemical Cycles

## Fall 2015, Lecture: M/W, 9:00 – 10:30 am

**Instructors** Dr. Lixin Jin Phone: 747-5559  
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Office Hours: M 10:30-12:00, or by appointment

**Text** Global Environment: Water, Air, and Geochemical Cycles (1996) by Berner and Berner (electronic version is also available)

**Goals:** Introduction to the water and energy balance, and the global elemental cycles. This course will discuss Earth surface processes, different water reservoirs, environmental hot topics, and natural/anthropogenic cycles of C, P, S and other elements. Special focuses will be placed for the arid

**Grading** Your course grade will be determined as follows:

Quizzes and homework	25%
Summary of journal articles	10%
Thoughtful participation in discussions	10%
Final project (Presentation + summary*)	55%

*(\*You are required to write a 6-page summary for the term project, in addition to the presentation. The summary should be 1.5 line space, Times New Roman font 11, not including references)*

**Summary of Journal Articles:** Periodically throughout the semester, I will give you journal articles to read and summarize. We will then discuss these articles in class.

**20-min presentation of a term project:** A term project focuses on a specific topic of your own interests. It requires literature search of related journal articles, summary of these findings, and 20-minute PowerPoint presentation, followed by questions in the audience.

**Students with disabilities:** UTEP strives to make accommodations for students with identified special needs. In order to receive these accommodations, you must first register with UTEP Disability Student Services Office at <http://sa.utep.edu/dsso/>. In addition, please make an appointment to see me during the first week of the quarter to notify me of the needed accommodations.

**Class policies and academic Integrity:** Cellular phones and pagers are to be turned off or placed in silent mode during class. Conducting telephone conversations or texting messages during class time are prohibited.

We follow University Policies as outlined in the academic regulations in the 2006-2008 Undergraduate Catalog (<http://www.utep.edu/catalogs/2006/2006-2008UG.pdf>). This includes the scholastic dishonesty policy as outlined in the UTEP Handbook of Operating Procedures that can be accessed under the student affairs link at <http://www.admin.utep.edu/hoop>. Some assignments may require collaboration among students or summarization of books and articles.

Each student's homework, etc. should be completed in his/her own words. When referencing another author's work, make sure to cite the reference appropriately. A violation of academic integrity will result in a 0.0 grade for that assignment. Repeated violations may result in a 0.0 for the course.

**Attendance Policy:** Class members are expected to attend all classes. I reserve the right to drop you from the course if you miss more than 4 class meetings. Absences for University-recognized activities (e.g. sports, professional conferences), and religious holidays will be excused provided that you tell me at least a week ahead of time.

### Tentative Lecture

week	Topic
8/24	Syllabus, Overview, Course Objectives, Introduction, systems, box models, periodic table
8/31	Global water cycles, water chemistry basics
9/7	<i>(University is closed on 9/7 for Labor Day)</i> Chemical weathering, soil formation and critical zone processes
9/14	Carbon in marine and terrestrial environments and climate change, Carbon sequestration ( <b>project title due</b> )
9/21	Rainwater, rivers, Lakes
9/28	Watershed hydrology
10/5	Long-term changes in ocean chemistry ( <b>Reference list due</b> )
10/12	Nutrients: nitrogen and phosphorus
10/19	Sulfur in the environments
10/26	Redox Reactions and Fe cycling ( <b>3-page summary due</b> )
11/2	Ca, Mg and pedogenic carbonate
11/9	Trace metals matter: Pb and Mn cycling
11/16	Si and its biological cycles
11/23	Dust and its global impacts (evaluation)
11/30	Student Presentation
12/2	<b>Term paper due (5:30pm hardcopy, or 11:59pm electronically)</b>

Examples of term project topics:

1. Dust deposits and its significance in soil formation and elemental cycles
2. Shales' impacts on elemental cycles (C, metals)
3. Acid mine drainage and metal contamination in rivers and soils
4. Anthropogenic cycling of As
5. Acidification of sea water and its impacts on oceans biogeochemical cycles