**COURSE SYLLABUS**

**GEOL 4200 – Biogeochemistry**

Spring 2019

Dr. Kimberly Lau

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ESB 3012, 307-223-2102 (office)

Office hours: Tues. 9 to 10 am and Thurs. 4 to 5 pm, or by appointment via email

**COURSE SCHEDULE:**

Tuesdays and Thursdays, 2:45-4:00, GE 213

**PREREQUISITES:**

This is a 3-credit, elective course for the geology major. I will assume that you have taken GEOL 1100, GEOL 2000, and the CHEM requirements. Completion of GEOL 3500 is encouraged. Please discuss with me during the first week of the semester for exceptions.

**COURSE DESCRIPTION:**

Biogeochemistry is the exploration the physical, chemical, and biological processes that govern the exchange of energy and elements between the biosphere and geosphere. This course will examine principal biogeochemical cycles (*e.g.*, C, O, S, N, P, and other elements of interest) with a focus on geologic processes and geologic origins. Drawing from the primary literature, we will investigate how biogeochemical cycling has changed over Earth’s history and as a result of human activities. This topic incorporates concepts of geology, biology, and environmental science and is appropriate for students in those disciplines as well as anyone wanting to learn more about process and function of the Earth.

**COURSE OBJECTIVES:**

Students who complete this course will demonstrate the ability to:

1. Describe the major fluxes and transformations in the global carbon, nitrogen, and phosphorus cycles.
2. Evaluate biogeochemical data that span large spatial and temporal scales.
3. Compare the roles of geologic processes on marine and terrestrial biogeochemistry.
4. Apply knowledge of biogeochemical cycles to evaluate environmental issues and make predictions about the impacts of human activities in marine and terrestrial systems.

During this course, students will practice the following skills:

1. Read, critique, and discuss scientific literature.
2. Develop a research question and be able to explain its significance.
3. Quantitative skills, including data collection and interpretation.
4. Effective oral, visual, and written communication.

**TEXTS AND READINGS:**

1. William H. Schlesinger and Emily S. Bernhardt. 2013. Biogeochemistry: An Analysis of Global Change. 3rd Edition. ***This textbook is available for free download through the UW Library website.***
2. Additional readings, including scientific papers, will be assigned through the course website.

**COURSE REQUIREMENTS AND EXPECTATIONS:**

***Class activities*** will be the focus of the second half of the class period. These assignments will incorporate quantitative reasoning and will focus on applying skills and concepts explored in class. ***Homework*** will focus mostly on reading responses to assigned scientific papers. Please keep these materials organized in a 3-ring binder, which I will periodically collect and grade. Please talk to me if you need access to a 3-ring binder or a hole punch.

Two ***letters of intents*** (LOIs) will be submitted. Research requires funding and getting that money is done through a competitive proposal process. In small groups, you will practice this process through a LOI competition in which you will submit a 2-page proposal and give a 5-minute spiel to sell your idea. LOIs for each group will receive one grade, but you will receive an individual presentation score.

The ***poster project***will focus understanding the biogeochemical cycle of your choice. A rubric will be provided, but will be judged on: visual presentation, a well-researched reference list, and application to a scientific question.

***Exams*** will focus on your conceptual understanding of the ideas taught in class and explored in the activities and projects. The format of the exams will vary based on the content covered and may include short answer, essay questions, simple calculations, and problem solving. The final exam is comprehensive.

***Attendance and participation*** in class is expected, including full effort during class activities. By signing up for this course, you are signing up to learn the material from myself as well as your peers. Examples of participation can include bringing up questions during in-class discussions, posting responses to the online forum, and responding to exit tickets. In addition to the projects for each module, the assigned reading will be discussed as part of each class (posted online on course website). Science involves questioning and discussing papers, any comments, including clarifying questions, are useful to contribute in class.

**GRADING:**

 Class activities/homework: 125 (25%)

Poster project: 125 (25%)

LOI’s: 50 (10%)

Exam: 50 (10%)

Final Exam: 100 (20%)

 Participation: 50 (10%) **Total** **500(100%)**

***There will be no scheduled make-up tests. If you need to miss a test for an emergency, please email me prior to the scheduled time. All exam and due date conflicts must be resolved within the first two weeks of the semester.***

***Late assignments will receive an automatic 10% reduction in grade. After one week past the due date, no credit will be given.***

Any questions regarding grading should be addressed as described below.

1. Please wait 24 hours after receiving your grade before initiating questions regarding grading.

2. Notify me within one week of the return of the assignment/exam of any grading question. (If questions are not raised within one week of the return of the exam or assignment, the grade is final). If there is no obvious error in the grading, then you must follow the procedure outlined in 3 and 4 below.

3. Using your class notes, handouts and or/other information, you must write an explanation as to why you believe your answer is correct.

4. After evaluating the explanation I will determine if the grade should be altered and I will respond to you either verbally or with a written explanation. Faculty decision on the grade is final.

**COURSE POLICIES:**

***Course Website***
I have created a course website on WyoCourses and will use the site to post announcements, readings, and other materials. Lecture slides will be shared after each class. Most course communication will be through WyoCourses; please check your email or the site daily to keep current with the course.

***Attendance and Participation***

University sponsored absences are cleared through the Office of Student Life. Students who are absent more than FOUR times during the semester without a valid excuse (legitimate medical condition or mandatory university activity) will be penalized 5% from their total grade. For other attendance questions please email me at least 2 hours before class begins.

Active participation is expected and will be considered part of your grade as described above.

***Academic Honesty***

UW Regulation 6-802. The University of Wyoming is built upon a strong foundation of integrity, respect and trust. All members of the university community have a responsibility to be honest and the right to expect honesty from others. Any form of academic dishonesty (e.g., cheating on exams, plagiarism, reuse of assignments, improper use of the internet and electronic devices, unauthorized collaboration, alteration of graded assignments, forgery and falsification, lying, facilitating academic dishonesty, and unfair competition) is unacceptable to our community and will not be tolerated [from the University Catalog]. Teachers and students should report suspected violations of standards of academic honesty to the instructor, department head, or dean. Other University regulations can be found at: <http://www.uwyo.edu/generalcounsel/new-regulatory-structure/index.html>

In addition, the specific ethics guidelines for this course are as follows:

1. I encourage you to discuss assignments with other students in the class, but do not collaborate with other students when you write your responses.
2. Exams must be completed without any collaboration with anyone else.

**Computers and electronic devices**Laptops are required for some of the class activities; I will announce these in advance. I encourage you to take notes with pen and paper, as this method has been shown to increase focus and retention. When you do use your computer in class, please be aware that this is a privilege and I expect that you will be using technology in ways that are only for your learning. This expectation holds for cell phone, which should be on silent or turned off, and kept in your backpack.

***Other policies***

If you have a physical, learning, or psychological disability and require accommodations, please let me know immediately. You will need to register with, and provide documentation of your disability to University Disability Support Services (UDSS) (in “Student Educational Opportunity”), 109 Knight Hall, Phone: 307 766-6189, Fax: 307 766-4010, Email: udss@uwyo.edu