

## ENVIRONMENTAL BIOGEOCHEMISTRY SWS5224

**Term:** Spring Semester  
**Meeting Room:** 3194 McCarty Hall-A  
**Meeting Time:** Monday, 1:55 - 2:45 pm (7<sup>th</sup> period)  
**Instructor:** Dr. P.W. Inglett  
Office: 3171 McCarty Hall-A  
Phone: 294-3170  
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**Office hours:** By appointment

**Course Description/Objectives:** This course is designed as an overview of the biogeochemical processes affecting elemental cycling in global environmental systems. At the end of this course, students should be able to 1) describe the major theories and scientists involved in the development of the discipline of biogeochemistry, 2) explain and apply quantitative and qualitative approaches of studying biogeochemical cycles, 3) summarize the biogeochemical properties of the major global systems (terrestrial, atmospheric, and oceanic systems), 4) describe the processes in the carbon, nitrogen, phosphorus, and sulfur cycles, and relate these processes to global patterns of productivity, pollution, and consequences of environmental change.

**Course Format:** Web-based lecture with in-class discussion.

**Class Attendance:** Attendance is required for participation in discussion. All students are required to review the online materials in accordance with the course schedule and participate in the discussion session each week.

**Pre-Requisites:** BSC 2010 and BSC 2010L, CHM 2045 and 2045L

**Course Texts:**

*Optional* - Mackenzie, F.T. Our Changing Planet: An Introduction to Earth System Science and Global Environmental Change. 4<sup>th</sup> Edition. 2010. Prentice Hall.

Andrews, J.E., P. Brimblecombe, T.D. Jickells, P.S. Liss, and B.J. Reid. An Introduction to Environmental Chemistry. 2<sup>nd</sup> Edition. Blackwell.

Atlas, R.M., and R. Bartha. 1998. Microbial Ecology. 4<sup>th</sup> Edition. Benjamin/Cummings.

Bashkin, V.N. 2002. Modern Biogeochemistry. Kluwer Academic.

Jacobson, M.C., R.J. Charlson, H. Rodhe, and G.H. Orians. Earth System Science: From Biogeochemical Cycles to Global Change. International Geophysics Series. Volume 72. Elsevier, Academic Press.

**Course Website:** All lectures, readings, assignments, and other course materials including exams will be accessible using Sakai via the UF e-Learning portal:  
<https://lss.at.ufl.edu/>

**Grading System:** 40%-Exams, 10%-Quizzes, 10%-Attendance, 20%-Problem sets, 20%-Paper

Final letter grades will be assigned as follows based on the UF policy for grades and grade points effective May 11, 2009: <http://registrar.ufl.edu/catalog/policies/regulationgrades.html>

Course Grade	>90	89-87	86-83	82-80	79-77	76-73	72-70	69-67	66-63	62-60	59-57	<57
Letter Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E
Grade Point	4	3.67	3.33	3	2.67	2.33	2	1.67	1.33	1	0.67	0

**Exams:** Examinations will be administered online using the *ProctorU* service to ensure a secure testing environment. Each student must have access to a suitable computer with a web cam, microphone, and speakers. Students can go to the website <http://www.proctoru.com/> and click on “How To Get Started”. This will permit students to create an account and test their system. Once an instructor makes an exam available, students go online to *ProctorU* to schedule the exam session. Students must provide a valid email address and phone number where they can be reached during an exam.

**Quizzes:** Students will be required to complete quizzes after their review of materials for each week. These quizzes are intended to ensure that students stay on track with the course material and online lectures and are able to fully participate in the discussion sessions. Quizzes will be made available through the Sakai course management system during the week in which the material for that quiz is covered (see course outline for schedule of topics).

**Attendance:** Attendance and participation in discussion sessions is mandatory. Attendance will be graded as the percentage of all classes attended, with each student being granted one (1) grace absence (not included in calculation).

**Graduate Student Project/Report:** Each student will be given a topic/environmental issue related to biogeochemistry for which they will prepare a 2,500 word paper (not including references) describing the fundamental processes involved and summarizing the current literature on the topic.

**Make-up Exams/Assignments:** All assignments including projects and homework problem sets will be assigned with ample time for completion. As a result, **assignments will be considered late after 5:00 pm on the due date**. Students are not permitted to miss exams except for **approved and documented** absences (hospitalization, death of family member, etc.) in accordance with the University policy on absences: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>. If an exam is missed for an approved reason, a make-up exam will be scheduled for the first week following the return of the student to class. Make-up tests may or may not be of the same format as that of the missed exam. No make-ups will be allowed for quizzes which are used to gauge class attendance and participation.

**Class Demeanor:** Students are expected to compose themselves in an adult and professional manner and give complete consideration for the professor and fellow students. This includes punctual attendance and the silencing of cell phones and similar electronic devices during class.

**Academic Honesty:** As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: “*We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.*” You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: “*On my honor, I have neither given nor received unauthorized aid in doing this assignment.*”

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: <http://www.dso.ufl.edu/SCCR/honorcodes/honorcode.php>.

**Software Use:** All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

**Campus Helping Resources:** Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university’s counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- *University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575, [www.counseling.ufl.edu/cwc/](http://www.counseling.ufl.edu/cwc/)*  
Counseling Services  
Groups and Workshops  
Outreach and Consultation  
Self-Help Library  
Training Programs  
Community Provider Database
- *Career Resource Center, First Floor JWRU, 392-1601, [www.crc.ufl.edu/](http://www.crc.ufl.edu/)*

**Services for Students with Disabilities:** The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must

then provide this documentation to the Instructor when requesting accommodation. 0001 Reid Hall, 352-392-8565, [www.dso.ufl.edu/drc/](http://www.dso.ufl.edu/drc/)

**Course Schedule and Topics:** The course is presented in 12 modules that will be released according to a set schedule. Each module will contain lectures in Adobe Presenter® which will explain and expound upon information presented in book chapters and course handouts. Each student is encouraged to make their own notes on each module. Associated with each module will be reading material that may elucidate the material in the lecture slides and a quiz which will introduce students to the types of questions that may appear on exams. In order to remain on schedule, the study of this material and the quiz must be completed during the week prior to the scheduled chat session.

**Course outline:**

Week*	Module	Topics Covered*	Book Chapter**/ Handout #
1	1	Introduction/Biogeochemistry and its History	Handout 1,2
2	2, 3	Analysis of Cycles and Processes	Handout 3,4
3	4	Earth Systems: Lithosphere	Ch.2, 3**
4	5	Earth Systems: Atmosphere	Ch.4
Jan. 31		<b>Exam 1</b>	(Modules 1-3)
5	6	Earth Systems: Hydrosphere	Ch.5
6	7	Earth Systems: Ecosphere	Ch.6
7	8	Carbon Cycle	Handout 5
8	8	Carbon Cycle cont.	Handout 5
Feb. 28		<b>Exam 2</b>	(Modules 4-7)
		<i>Spring Break</i>	
9	9	Nitrogen Cycle	Handout 6
10	10	Phosphorus Cycle	Handout 7
11	11	Sulfur Cycle	Handout 8
12	12	Environmental Change: Land Use /Soil Erosion	Ch. 10, 11
13	12	Environmental Change: Eutrophication/Acid Rain	Ch. 11, 12
Apr. 11		<b>Exam 3</b>	(Modules 8-11)
14	12	Environmental Change: Climate Change	Ch.13, 14
15		Course Review	
May 1, 10:00am		<b>Final Exam</b>	(comprehensive)

\* Dates for topics or exams are tentative, and subject to change.

\*\* Chapters listed are from Mackenzie, F.T. *Our Changing Planet: An Introduction to Earth System Science and Global Environmental Change*. 4<sup>th</sup> Edition. 2010. Prentice Hall.