

Carleton A, 3.

senior
CC Global biogeochemistry

Chemistry/ENTS 365--**Global Biogeochemistry**
Spring 1997
Mudd 60, 4a

An Earth-system approach is taken from the different perspectives of the chemical, physical, biological and earth sciences to the study of the interactions, transformations, and movement of matter and energy on a global scale. The class will be discussion-oriented and the texts will be supplemented with recent journal articles and guest speakers. **Prerequisites:** Chemistry 121 or 123, and one or more of the following: Chemistry 228 or 343; Biology 352; Geology 210 or 220; or Physics 238.

INSTRUCTOR: Will Hollingsworth, Mudd 174, x4412, wholling@carleton.edu. Office hours will be announced in class. You may also make an appointment for some other time or just take your chances by dropping by.

TEXTBOOK and REFERENCE MATERIALS: Biogeochemistry, An Analysis of Global Change, by William H. Schlesinger (Academic Press, 1991) is required. A second book, Global Biogeochemical Cycles, edited by Butcher, Charlson, Orians, and Wolfe (Academic Press, 1992), is recommended. Supplemental readings (e.g. focus issues, current literature, extra background) will be assigned through material that is either distributed in class or available on reserve in the Science Library.

COURSE REQUIREMENTS and GRADING:

Final Paper	25%
'Midterm' Exam	25%
'Midterm' Project	15%
Discussion and Presentations	15%
Homework	10%
Writing Projects	10%

CHEMISTRY DEPARTMENT STATEMENT on GROUP WORK:

In your chemistry courses, there are many times when you will be expected to participate in group work (e.g. laboratory team work, group quizzes, and group homework assignments). This reflects the belief of the Chemistry faculty that gaining experience with both formal and informal group work is indispensable toward the learning and practice of modern chemical science. The department values and expects mutual respect, cooperation, and communication among team members as well as an equitable distribution of effort. If you encounter anything which interferes with your ability to learn from and complete any group work, we want to know about it. Please consult with your Instructor, the Chemistry Department Chair (Will Hollingsworth, Mudd 174, x4412), or Associate Chair (Marion Cass, Mudd 170, x5861) so that the situation may be promptly resolved.

Access to Information on Global Biogeochemistry

On Closed Reserve in the Library:

- Schlesinger, Biogeochemistry
- Butcher et al., Global Biogeochemical Cycles (GBC)
- Wayne, Chemistry of Atmospheres [under Chem 123 (Ferrett)]

On Open Reserve in the Library:

- Skinner and Porter, The Blue Planet
- Scientific American, Managing Planet Earth
- Bunce, Environmental Chemistry

Reading Guide to the Schlesinger book:

		<u>in Butcher's GBC</u>	<u>other resources</u>
A. Origins			
1. Of the planet	2: 12-23	2: 9-20	
2. Of life	2: 23-32	3: 21-48	
B. Atmosphere	3: 40-71	10: 213-238	Wayne
C. The Solid Earth	4: 72-106	6,7,8: 93-171	
D. Cycling			
1. In biosphere	5: 108-140	3: 49-51	
2. In solid earth	6: 142-194	6,7,8: 93-171	
3. In fresh water	7,8: 195-253	-----	
4. In oceans	9: 254-293	9: 175-209	
E. Global Cycles			
1. Water	10: 297-306	-----	
2. Carbon	11: 308-321	11: 239-259	
3. Nitrogen	12: 324-331	12: 263-282	
4. Phosphorus	12: 331-335	14: 301-313	
5. Sulfur	13: 336-348	13: 285-299	
F. Important Aspects not in Schlesinger			
1. Trace metals cycling		15: 317-350	
2. Modelling details		4: 55-72	
3. Relevant chemistry		5: 73-90	

Journals with lots of biogeochemistry material:

- Geochemical Journal
- Geophysical Research Letters
- Global Biogeochemical Cycles
- Global and Planetary Change
- Journal of Geophysical Research
- Nature
- Science