

ESM 202 Environmental Biogeochemistry

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OH: open door policy/email appt.

Lectures: Bren Hall 1414, 9:30 to 10:45 am Tuesday and Thursday

The goal of this course is to provide you with a scientific basis to understand:

- Major disturbances to cycling of elements in the environment
- Pollution and its implications
- A range of approaches to understand and develop solutions to these problems
- How this is relevant in your daily life as well as for your career

LECTURES

Week 1	Why is biogeochemistry relevant for solving environmental problems? Understanding water quality: Part I
Week 2	Understanding water quality: Part II Eutrophication and P cycle
Week 3	N Cycle – sources, processes and effects Understanding Air quality
Week 4	Sulfur cycle – sources, processes and effects Acid mine drainage Atmospheric deposition
Week 5	Carbon cycle and ocean processes Terrestrial carbon dynamics
Week 6	Wetland biogeochemistry MIDTERM (Feb. 14 in class)
Week 7	Trace elements – sources, processes and effects Lead, mercury and copper
Week 8	Emerging organic pollutants Micro and nano pollutants
Week 9	Ecotoxicology Life-cycle assessment & biogeochemistry
Week 10	Modeling Biogeochemistry to Inform Policy Decisions Synthesis and interactions
March 19	FINAL EXAM (8-11 am, in Bren Hall 1414)

DISCUSSIONS

D1: Tu 12:30-1:20 ; D2: 2:30-3:30; D3: W 12:30-1:20 and D4: W2:30-3:30 (all in Bren 1510)

TAs: Heili Lowman (OH Th 1-2 pm Noble Hall 2131)

Violaine Desgens-Martin (OH W 1:25-2:25 Bren Hall 3017)

Week	Topics
1	Chemistry boot camp (Or what I really need to know to make the most of this course)
2	Water quality concepts
3	N & P biogeochemistry
4	Air quality concepts & Sulfur cycle
5	Carbon cycle
6	Review for midterm
7	Trace elements
8	Emerging pollutants
9	Open topic
10	Review for final

GRADING

- Assignments: 3 x 15% each (#1 Due Week 4, #2 Due Week 8, #3 Due Week 10, on Mondays)
 - The assignments are INDIVIDUAL, and be careful when using information from a published source to express it in your own words after you analyze it
- Midterm: 20%
- Final: 35%

Reading Materials

Textbook: Biogeochemistry, by Schlesinger and Bernhardt

Week	Readings
1	Chapters 1 and 8 & Article on Water Quality
2	Chapters 6 and 12
3	Chapter 3 & Article on Air Quality
4	Chapter 13
5	Chapters 5, 9 and 11
6	Chapter 7
7	Article on Trace Elements
8	Article on Emerging Contaminants
9	Article on Ecotoxicology
10	Chapter 14

Articles will be posted to the course website in Gauchospace.

Homework assignments will be posted to Gauchospace.