

**Syllabus**  
**Biogeochemistry Seminar (45 hours lecture; 3 credits)**  
**Spring 2016, Instructor: Peter Groffman**

Biogeochemistry is the study of the fluxes of energy, water, carbon, nutrients and other elements across the earth's surface. This integrative discipline is highly relevant to multiple aspects of Environmental Science including analysis of climate and land use change and air and water pollution. The course will begin with a discussion of the basic science of biogeochemical cycles at global, regional, landscape and ecosystem scales and then move towards application of biogeochemical principles to current topics of interest in Environmental Science.

Each three hour class session will consist of approximately one hour of lecture, one hour of student/instructor interaction on specific topics that will be developed for annotated bibliographies, oral presentations and final papers and one hour of either instructor or student-led presentations on special topics.

<b>WEEK</b>	<b>TOPIC</b>
1	Introduction and History
2	Atmosphere and Lithosphere
3	Biosphere/Terrestrial Environments – 1
4	Terrestrial Environments - 2
5	Aquatic Environments – Wetlands, Inland Waters, Oceans - 1
6	Aquatic Environments – Wetlands, Inland Waters, Oceans – 2
7	The Water Cycle
8	The Carbon Cycle
9	Nitrogen and Phosphorus Cycles
10	The biogeochemistry of climate change
11	The watershed approach
12	The biogeochemistry of agriculture
13	The biogeochemistry of cities
14	The biogeochemistry of air and water quality
15	Future perspectives in biogeochemistry

**Method of Evaluation:**

- 10% Class participation
- 30% Annotated Bibliography and Oral presentation
- 30% Final paper
- 30% Final Exam

**Method of Assessment:**

- **Annotated Bibliography & Oral Presentation:** Each student will be responsible for assembling an annotated bibliography for a pre-approved topic in biogeochemistry that has or is currently receiving much attention from the scientific community, media and the general public. Students should organize their annotated bibliography to give an overview of the topic (i.e. intro, article summaries, and conclusion). Students will also be required to present their research on this topic to the rest of the class (i.e. teach a class on the subject) during a 30 minute presentation.
- **Class Participation:** Active participation in class discussions is strongly encouraged and highly valued.
- **Exam:** The final exam will focus on major concepts discussed during the semester and may consist of any combination of the following types of items: diagrams, short answer and essay questions.
- **Final paper:** Students will produce a paper 5 – 10 pages on the topic that they develop for their oral presentation.

**Textbook**

Schlesinger, W. H., and E. S. Bernhardt. 2013. *Biogeochemistry: An Analysis of Global Change*, Third Edition. Academic Press, New York.