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### GEO 320.02: Global Water Cycle

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## Geosciences 320: Global Water Cycle Syllabus: Fall 2015

### *Instructor*

Nancy Hinman  
CHCB 316  
406-243-5277  
Office hours: M 3:00 – 4:00 pm, W 10-11 am, and by appointment  
[nancy.hinman@umontana.edu](mailto:nancy.hinman@umontana.edu)

### *Course Information*

Meeting time: MW 5:10 – 7:00  
Meeting place: CHCB 348-333

**Text:** Berner and Berner, 2012. Global Environment: Water, Air, and Geochemical Cycles (2<sup>nd</sup> edition). Princeton University Press, Princeton, NJ.  
Day, 2007. How to Write and Publish a Scientific Paper (7<sup>th</sup> edition). Greenwood Publishing Group, Santa Barbara, CA.

**Moodle:** We will use an online course supplement. Please be sure your official UM address is functioning properly as I must use this address to communicate with you.

**Objective:** This course provides a broad introduction to the chemistry of different water reservoirs (e.g., atmosphere, groundwater, seawater) in the hydrological cycle. Dissolved components are used as tracers through the hydrological cycle. Chemical and physical processes that change water chemistry are discussed. The prerequisite is one semester of college chemistry. Familiarity with the periodic table is required. Some knowledge of rocks and minerals is desirable, but please see me if you need help with this.

**Evaluation:** Students are evaluated on assignments and class participation. Students are expected to contribute relevant information to class discussions and will be evaluated on the quality of such contributions. Students will occasionally lead class discussions or make presentations. Writing assignments will be used to evaluate students' abilities to explain and critically evaluate concepts in the class.

**Writing Assignments:** Formal writing assignments will consist of one abstract (150 words), one laboratory research paper (~6 – 8 pages), and one research paper (10 – 12 pages). The research paper will be submitted, evaluated, returned, revised, and resubmitted for the final paper grade. The grade will be based on the final document and on the degree to which comments were addressed between the first and second versions. Informal writing assignments in and out of class will be used to emphasize important concepts. Fifty percent of the course grade will be based on written work; both content and quality of writing will be evaluated.

**Late Work:** Assignments, drafts, and papers are expected by 5 pm on the due date. Late assignments will be accepted after the due date with a 10 % penalty assessed after grading.

**Attendance:** Students are expected to be in class. Absences affect the participation portion of the grade.

**Grading:** Grades will be based on participation in class (25 %), assignments (25 %), and writing assignments, including both papers and in-class assignments (50 %).

Points Percentage	Grade
90 - 100	A
80 - 89	B
70 - 79	C
55 - 69	D
< 54	F

### *Learning Outcomes for GEO 320*

- Describe the major processes controlling water chemistry in the environment
- Understand the relationship between chemistry and water type or location
- Evaluate the effects of human activities on the global water cycle
- Identify and pursue more sophisticated questions for academic inquiry (W)
- Find, evaluate, analyze, and synthesize information effectively from diverse sources (W)
- Manage multiple perspectives as appropriate (W)
- Recognize the purposes and needs of discipline-specific audiences and adopt the academic voice necessary for the chosen discipline (W)
- Use multiple drafts, revision, and editing in conducting inquiry and preparing written work (W)
- Follow the conventions of citation, documentation, and formal presentation appropriate to that discipline (W)
- Develop competence in information technology and digital literacy (W)

This course includes a component of information literacy. This from the Mansfield Library website (<http://www.lib.umt.edu/informationliteracy>) defines information literacy...

ACR Standards for Information Literacy include:

- Standard One: The information literate student defines and articulates the need for information.
- Standard Two: The information literate student accesses needed information effectively and efficiently.
- Standard Three: The information literate student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system.
- Standard Four: The information literate student, individually or as a member of a group, uses information effectively to accomplish a specific purpose.
- Standard Five: The information literate student understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally.

In order to help you determine what I expect from your writing, please refer to the Washington State University Critical Thinking Rubric page:

[Washington State University Critical Thinking Rubric page](#)

**Policy on plagiarism:** It is imperative that students perform their own work and contribute to group work equally. To present someone else's work as your own is plagiarism. Often times plagiarism takes the form of using sentences and paragraphs from published work without proper citation; either the concepts should be reconstituted to reflect understanding of the topic or the sentences should be put in quotation marks and properly referenced. The former is preferred. The latter should be minimal. Plagiarism won't be tolerated in this class. For additional information on plagiarism in the context of the University of Montana policy, please see this page:  
<http://libguides.lib.umt.edu/plagiarism>.

**Policy for accommodating disabilities:** The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students. If you think you may have a disability adversely affecting your academic performance, and you have not already registered with Disability Services, please contact Disability Services in Lommasson Center 154 or 406.243.2243. I will work with you and Disability Services to provide a reasonable modification. "Reasonable" means the University permits no fundamental alterations of academic standards or retroactive modifications.

Dates	Topic	Writing Presentations and Research Paper	Abstract	Lab Report	Problem Sets	Chapter (Day)	Chapter (B&B)
8/31, 9/2	Hydrological cycle, Air and aerosol chemistry					1, 3	1, 2 (p. 58)
9/7, 9	9/7 No class. Aerosol and rain chemistry	9/9 Special Presentation				4, 5	2
9/14, 16	Rain chemistry	9/14 Special Presentation	Abstract assignment available		9/16 Excel training (tentative), PR set 1 available	27 (1st section), 9	3
9/21, 23	Rain Chemistry, Biogeochemistry	9/21 Field trip					readings, 4
9/28, 30	Chemical weathering			Lab assignment available		7-15 (use your judgement)	4
10/5, 7	Laboratory planning, Chemical weathering		10/7 Abstract assignment due				4
10/12, 14	Groundwater chemistry			10/12 Lab sample due	10/14 PR set 1 due		4
10/19, 21	Groundwater chemistry	10/19 Information literacy (ML 283)					4
10/26, 28	River chemistry				PR set 2 available		5
11/2, 4	River chemistry, Lake chemistry	11/2 Research paper problem statement and bibliography due				23, 30, 31	6, readings
11/9, 11	Lake chemistry, 11/11 No class			11/9 Lab report due			
11/16, 18	Estuarine chemistry,						6
11/23, 25	Estuarine chemistry, 11/25 No class	11/23 First draft research paper due					7
11/30, 12/2	Ocean chemistry						8
12/2, 4	Ocean chemistry						8
12/7, 9	Ocean chemistry						
12/14,	5:30-7:30 Final meeting	Research paper due			PR set 2 due		