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GEO 202.01: The Water Planet

Natalie Bursztyn
University of Montana, Missoula, natalie.bursztyn@umontana.edu

William Payton Gardner
University of Montana, Missoula

Geosciences 202: Water Planet Spring 2022

Course Information

- Instructors: Marc Hendrix Natalie Bursztyn
- Office: CHCB 363 CHCB 367
- Email: marc.hendrix@umontana.edu natalie.bursztyn@umontana.edu
- Office Hours: 1:00-2:00pm M 12:30-2:00pm, W 1:00-2:00pm
- Teaching Assistant: David Baude david.baude@umconnect.umt.edu
- Class meetings: T/Th 12-1:50, CHCB 111

Overview

The Water Planet will introduce students to the study of the hydrologic cycle and associated Earth-surface processes. The course will describe the mechanisms that control the movement of water and the influence of water fluxes on landscapes, ecosystems, and humans. The course will describe the mechanisms underlying the processes that shape the earth's surface and drive its evolution, including climate, hydrology, landscape evolution, and basic nutrient and chemical cycles. The course will combine lectures, field data collection, data analysis, and lab activities. Active learning and student participation will be an essential component.

Learning Outcomes

Students in this course will:

- Practice applying fundamental concepts in physical systems
- Make connections between climate, hydrology, landscape, and chemical processes
- Develop observational skills
- Collect and analyze surface-processes data
- Develop scientific writing skills
- Develop physical and conceptual models, and use data, and logical reasoning to critically evaluate and connect information about Earth-surface processes
- Communicate understanding of the interrelationships among Earth science concepts and theories to peers and others
- Work as members of productive, collaborative teams.

Assessment

30% Lab and field projects
20% Midterm exam
15% Journal quizzes, discussion & in-class assignments
15% Independent research project
20% Final exam

Course Information, Guidelines and Policies

Field Trips

We will have two required Saturday field trips, TBD (one all day, one half day), in addition to potential in-class on-campus "field trips". Field trips will entail field sketching, mapping, data collection and associated project reports.

Labs

There is no separate lab section for this class, but we will do regular lab (including computer lab) and field activities during class time, typically on Thursdays. These will provide active-learning opportunities and will often take time beyond the regular class time to complete (in those cases, they will be due at the beginning of class the following Tuesday). Computer lab activities will include work with excel, Google Earth, and various online data tools (web soil survey, NOAA, etc.).

Prerequisites

The following are prerequisites: Undergraduate level GEO 101N Minimum Grade of C- or Undergraduate level GEO 103N Minimum Grade of C- or Undergraduate level GEO 105N Minimum Grade of C- or Undergraduate level GEO 107N Minimum Grade of C-) and (Undergraduate level GEO 102N Minimum Grade of C- or Undergraduate level GEO 104N Minimum Grade of C-.

Attendance

In addition to lab exercises, there will often be short in-class activities that contribute to your grade. If you miss class, it is your responsibility to find out what you missed, which should involve consulting the course website and your peers (rather than the instructor).

Readings

Required textbook:

There is no required textbook for purchase. We will assign readings from open access educational resources, journal articles, and popular media, all of which will be available via Moodle. Journal article readings comprise a substantial portion of the course readings.

Course website

Please check the course website (Moodle) regularly, especially before class, for announcements, notes, readings, assignments, and schedule updates. Some of the class lecture notes will be posted.

Email

Feel free to communicate with the instructors by email. But please do not email with homework questions; instead, please ask homework questions in class (others are also likely to have similar questions) or at office hours.

Late Policy

Assignments handed in late will have 10% of total points are deducted per day late (starting at the time when the assignment is due). No credit allowed for assignments handed in > 1 week after due date or after answer key / grading rubric posted, whichever comes first. In-class assignments should be made up for content knowledge, but will not be accepted late.

Student Conduct Code

The Student Conduct Code at the University of Montana embodies and promotes honesty, integrity, accountability, rights, and responsibilities associated with constructive citizenship in our academic community. This Code describes expected standards of behavior for all students, including academic conduct and general conduct, and it outlines students' rights, responsibilities, and the campus processes for adjudicating alleged violations. Full student conduct code.

Course Withdrawal

Students may use Cyberbear to drop courses through the first 15 instructional days of the semester. Beginning the 16th instructional day of the semester through the 45th instructional day, students use paper forms to drop, add and make changes of section, grading option or credit. GEO202 may not be taken as credit/no-credit.

Disability Modifications

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and the Office for Disability Equity. If you think you may have a disability adversely affecting your academic performance, and you have not already registered with ODE, please contact them in Lommasson Center 154 or call 406.243.2243. We will work with you and ODE to provide an appropriate modification.

Grading policy

The following is a description of the grading scale, it may be adjusted at our discretion.

A	A 94-100%	Outstanding	Your work was **exceptional**: you have mastered the material. You consistently demonstrated an excellent understanding of all aspects of the course. You went above and beyond the requested outputs and offered unique insights and ideas. Your work exceeds my expectations for what I believe a student should demonstrate.
	A- 90-93%		
B	B+ 87-89%	Good to very good	You have **grasped the material**. Your work was complete, clear and understandable, and you consistently showed a strong understanding of the material. Your work meets my expectations for what I want students to take away from this course.
	B 83-86%		
	B- 80-82%		
C	C+ 77-79%	Satisfactory	You **completed the material**. You were able to grasp the majority of the concepts in the course; and demonstrated some ability to apply those concepts.
	C 73-76%		
	C- 70-72%		
D	D+ 67-69%	Barely satisfactory	Your work in the class was **barely acceptable**. Either you failed to complete some assignments, or your grasp of the course material was weak and incomplete.
	D 63-66%		
	D- 60-62%		
F	59% or less	Unsatisfactory	Your work was **unacceptable**. You did not learn the material.

Schedule

- The following page is a tentative (draft) schedule for the course
- Class meeting topics are subject to change, but the general schedule is lecture on Tuesdays and lab on Thursdays. Lab days may meet “in the field”, additional details for labs will be provided on Moodle and announced in advance
- Readings listed for a given week should be completed by Tuesday’s class (except for week 1)
- The readings will be listed and posted on Moodle, and will be updated throughout the semester
- Updates to the syllabus will be announced in class and posted on Moodle

Wk	Dates	Tuesday	Thursday	Saturday
1	Jan 18/20	Intro to Earth systems, origin of water & critical zone, intro to Lake Missoula	"Erosion game"	
2	Jan 25/27	Hydro cycle, ocean & atmosphere intro, water in atmosphere, weather systems	SST lab	
3	Feb 1/3	Climate zones, climate processes, and climate change	Boulder mapping lab	
4	Feb 8/10	Snow science	Snow lab 1	Field trip (snow pit data collect)
5	Feb 15/17	Snow lab 2 (process field trip data)	Weathering part 1: unifying concepts, streams	
6	Feb 22/24	Weathering part 2: Glaciers, current 'Ice House' mode; glacial-interglacial cycles; LGM and deglaciation; Younger Dryas; Little Ice Age	Topo lab + Google Earth	
7	Mar 1/3	Drainage basins, unifying concepts, systems thinking, water/mass/energy balance	Stream table lab	
8	Mar 8/10	Fluid dynamics & sediment transport, channelized fluid flow & sediment transport	Hydrograph lab	
9	Mar 15/17	Hillslope hydrology, surface hydrology	***MIDTERM EXAM***	
SPRING BREAK				
10	Mar 29/31	Critical zone, geochemistry & biogeochemistry	GW lab	Pooplars
11	Apr 5/7	Water & chemical transport processes, groundwater	Flathead lake lab	
12	Apr 12/14	Soil	TBD	
13	Apr 19/21	Eco-geo-hydro processes // Engineering geology, slope stability	Slope stability lab	
14	Apr 26/28	Water use & scarcity & predictions	TBD	
15	May 3/5	The Anthropocene	***student project presentations***	
16	May 9	***FINAL EXAM*** – Monday May 9, 8-10 am (ask the registrar why, we sure don't know)		