

Fall 2018

General Information

Course Code: ENV5 2310

Course Title: Earth Surface Processes

Course Description:

This course introduces aspects of Earth science that are critical to understanding environmental issues with societal impacts. Students will gain a basic understanding of biogeochemical cycling by exploring how biological processes control element fluxes between water, air, and earth materials. Topics of current interest, such as resource extraction, climate change and geoen지니어ing will be discussed in terms of their contributions to major element cycles. Seminars include quantitation exercises, hands-on exercises, and discussions to complement topics covered in the lectures

Credit Weight:

0.5

Academic Department (or campus):

School of Environmental Sciences

Campus:

Guelph

Semester Offering:

Fall 2018

Class Schedule and Location:

Lectures TuTh 10:30-11:20 MACKN 227

Seminar M 14:30-16:20 MACKN 225

Instructor Information

Instructor Name: Dr. Susan Glasauer

Instructor Email: glasauer@uoguelph.ca

Instructor Phone and Extension: (519) 824-4120 ext. 52453

Office location and office hours: Alexander 321; M 4:30-5:30

Course Content

Specific Learning Outcomes:

Students will be provided with opportunities to:

1. Understand key scientific concepts in biogeochemistry, with emphasis on the biological control of major and trace element cycling of major elements and select trace elements between terrestrial, aquatic and atmospheric reservoirs.

2. Demonstrate the development of critical thinking and problem solving skills for application in Earth science, as well as in the broader realm of environmental science and biogeochemistry;
3. Understand the benefits and challenges of interdisciplinary science in solving complex environmental issues;
4. Show improved literacy, in particular with respect to comprehension of scientific literature through assigned reading;
5. Demonstrate improved numeracy skills in an environmental Earth science context.

Lecture Content:

The course will follow the schedule of lectures, assignments and midterms shown on the following page.

Course schedule for lectures, seminars, assignments and midterms:

Week	Date	Class#	Topic	Reading	Seminar
1	Sept 6	1	Earth as a chemical system	BGC Ch 1 3-14	none
2	Sept 11	2	Scientific uncertainty	Boan2018; UncertSci	Models and estimation - DUE
	Sept 13	3	Earth origins	BGC Ch 2 15-28	
3	Sept 18	4	Evolution of life	BGC Ch 2 31-41	Gaia & feedback loops-DUE
	Sept 20	5	The atmosphere	BGC Ch 3 49-63	
4	Sept 25	6	Atmosphere reactions	BGC Ch 3 63-67	Residence time-DUE
	Sept 27	7	The lithosphere	BGC Ch 4 93-103	
5	Oct 2	8	Soil reactions	BGC Ch 4 103-111	Stable isotopes - DUE
	Oct 4	9	The Biosphere	BGC Ch 5 135-146;149-150	
6	Oct 11	10	The Biosphere	BGC Ch5 153-161;168-171	Thanksgiving holiday
7	Oct 16	11	Biogeochem cycling on land: C, N, S, P cycling	BCH Ch 6 195-203	MIDTERM I MONDAY MCKN
	Oct 18	12		BGC Ch 6 210-217	
8	Oct 23	13	Mass balance	BGC Ch 6 217-225	Redox reactions
	Oct 25	14	Wetlands: defin., occurrence	BGC Ch 7 233-255	
9	Oct 30	15	Wetland biogeochem	BGC Ch 7 259-273	Wetlands for bioremediation
	Nov 1	16	Wetland biogeochem		
10	Nov 6	17	Intro to freshwater	BGC Ch 8 275-288	Recurrence intervals - DUE
	Nov 8	18	Lakes and ponds	BGC Ch 8 288-303	
11	Nov 13	19	Lakes and ponds	BGC Ch8 303-308	Freshwater
	Nov 15	20	Rivers and streams	BGC Ch8 308-312;317-323	
12	Nov 20	21	Ocean circulation	BGC Ch 9 341-351	MIDTERM II MONDAY MCKN
	Nov 21	22	Ocean NPP	BGC Ch 9 352-357	
13	Nov 28	23	Ocean sediment diagenesis	BGC Ch 9 357-365	Global review (Thurs. make-up)
	Nov 29	24	Ocean carbon cycling	BGC Ch 9 365-368	

Students should be prepared to take notes in class by hand. Powerpoint is used on a limited basis only to reinforce select lecture material. Electronic devices (laptops, tablets) may be used in class only with instructor permission.

Labs:

Not applicable

Seminars:

Seminars take place on the Monday of the week and reinforce the topics of the course lectures. Work not completed during the seminar period must be handed in by the Thursday lecture of the same week.

Course Assignments and Tests:

Assignment or Test	Due Date	Contribution to Final Mark (%)	Learning Outcomes Assessed
Models & estimation	Sept. 13	3	1,2,3,5
Gaia and feedback	Sept. 20	3	1,2,5
Residence time	Sept. 27	3	1,2,5
Stable isotopes	Oct. 4	3	1,2,3,5
Recurrence intervals	Nov. 8	3	1,2,3,5
Midterm 1	Oct. 15	25	1,2,3,4,5
Midterm 2	Nov. 19	25	1,2,3,4,5
Final	TBA	35	1,2,3,4,5

Additional Notes (if required):

Assignments complement the seminar discussions and are due in lecture on the Thursday that follows the seminar on Monday.

Midterms take place during seminar periods. Students may use the entire two hour period to complete them.

Final examination date and time:

December 3, 8:30-10:30. Location TBA.

Final exam weighting:

35%

Course Resources

Required Texts:

Biogeochemistry: An Analysis of Global Change, 3rd edition. W. H Schlesinger and E. S. Bernhardt. Academic Press, 2013

This textbook will NOT be available on library reserve.

Other Resources:

Any additional reading will be posted on the courselink site for the course by week. Electronic materials from the lectures and seminars will also be posted on courselink after the lecture only.

Course Policies

Grading Policies:

Midterms are given during regular class meeting times (lectures and seminars, as described).

Policy on Late Assignments: Making up a missed exam or assignment requires a doctor's note or equivalent. Late assignments will be penalized at a rate of 20% markdown per day after the due date.

Copies of out-of-class assignments: Keep paper and/or other reliable electronic back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

Course Policy on Group Work:

Group work will be allowed only where explicitly assigned by the instructor.

Course Policy regarding use of electronic devices and recording of lectures:

Electronic recording of classes is expressly forbidden without consent of the instructor. When recordings are allowed, they are solely for the use of the authorized student and may not be reproduced, or transmitted to others, without the express written consent of the instructor.

Phones and laptops are distractions not just for the people using them, but for others sharing the same space. A Canadian study showed that students attempting to multi-task using laptops in the classroom did much worse than peers using pencil and paper to take notes. Even worse, students sitting next to the multi-taskers also suffered significantly ("Students' use of laptops in class lowers grades: Canadian study". Globe and Mail, August 14, 2013).

The use of laptops, tablets and cell phones, including checking messages, is prohibited during class time. Please leave the room if you need to use your phone. Laptops are essential for some students to take notes, but they create a distracting space within the classroom when not used for notetaking. You must discuss your use of an electronic device for taking notes with Dr. Glasauer prior to using it in the classroom.

University Policies

Academic Consideration:

The University of Guelph is committed to supporting students in their learning experiences and responding to their individual needs and is aware that a variety of situations or events beyond the student's control may affect academic performance. Support is provided to accommodate academic needs in the face of personal difficulties or unforeseen events in the form of Academic Consideration.

Information on regulations and procedures for Academic Consideration, Appeals and Petitions, including categories, grounds, timelines and appeals can be found in [Section VIII \(Undergraduate Degree Regulations and Procedures\) of the Undergraduate Calendar](#).

Academic Misconduct:

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community, faculty, staff, and students to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring.

University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection. Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

Detailed information regarding the Academic Misconduct policy is available in [Section VIII \(Undergraduate Degree Regulations and Procedures\) of the Undergraduate Calendar](#).

Accessibility:

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact the Student Accessibility Services (SAS), formerly Centre for Students with Disabilities (CSD), as soon as possible.

For more information, contact SAS at 519-824-4120 ext. 56208 or email sas@uoguelph.ca or visit the [Student Accessibility Services website \(http://www.uoguelph.ca/csd/\)](http://www.uoguelph.ca/csd/).

Course Evaluation Information:

End of semester course and instructor evaluations provide students the opportunity to have their comments and opinions used as an important component in the Faculty Tenure and Promotion process, and as valuable feedback to help instructors enhance the quality of their teaching effectiveness and course delivery.

While many course evaluations are conducted in class others are now conducted online. Please refer to the [Course and Instructor Evaluation Website](#) for more information.

Drop period:

The drop period for single semester courses starts at the beginning of the add period and extends to the Fortieth (40th) class day of the current semester (the last date to drop a single semester courses without academic penalty) which is listed in [Section III \(Schedule of Dates\) of the Undergraduate Calendar](#).

The drop period for two semester courses starts at the beginning of the add period in the first semester and extends to the last day of the add period in the second semester.

Information about Dropping Courses can be found in [Section VIII \(Undergraduate Degree Regulations and Procedures\) of the Undergraduate Calendar](#).

Additional Course Information**Commitment to the course:**

This course is worth 0.5 credits. According to University policy, you should plan on spending up to 12 hours per week engaged with this course, including lectures and seminars. That leaves around 8 hours to complete the reading and class assignments and to study the lecture material outside of class meetings. If you have invested this amount of time and still feel like you're struggling to keep up, please make an appointment to see me.