# Course Outline Form: Fall 2017

## General Information

**Course Code: ENVS 2310**

**Course Title:**

**Earth Surface Processes**

**Course Description:**

<http://www.uoguelph.ca/academiccalendars/>

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 geoengineering 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 2017

**Class Schedule and Location:**

Lectures TuTh 10:30-11:20 ALEX 218

Seminar M 14:30-16:20 GRHM 2310

## 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

## GTA Information

GTA Name:

GTA Email:

GTA office location and office hours:

## Course Content

### Specific Learning Outcomes:

[Associate Vice President Academic Webpage](http://www.uoguelph.ca/vpacademic/avpa/outcomes/)

[Learning Outcomes Resources](http://www.uoguelph.ca/vpacademic/avpa/pdf/LearningOutcomes.pdf)

[Course Specific Learning Outcomes](http://www.uoguelph.ca/vpacademic/avpa/outcomes/coursespecific.php)

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 7 | 1 | Earth as a chemical system | BGC *Ch 1* **3-14** | none |
| 2 | Sept 12 | 2 | Models and estimation  Earth origins | BCG *Ch 2* **15-28** | Gaia & feedback loops-DUE |
| Sept 14 | 3 |
| 3 | Sept 19 | 4 | Evolution of life  Atmosphere structure&function | BCG *Ch* 2 **31-41**  BCG *Ch* **3 49-63** | Residence time-DUE |
| Sept 21 | 5 |
| 4 | Sept 26 | 6 | Atmospheric biogeochemistry  The lithosphere | BCG *Ch 3* **63-73**  BCG Ch 4 **93-103** | Rock lab - DUE |
| Sept 28 | 7 |
| 5 | Oct 3 | 8 | Soil reactions  Soil development | BCG *Ch 4* **103-111**  BCG *Ch 4* **111-119** | Stable isotopes - DUE |
| Oct 5 | 9 |
| 6 | Oct 12 | 10 | The Biosphere and chemical cycling | BCG *Ch 5* **135-146** | **Thanksgiving holiday** |
|  |  |
| 7 | Oct 17 | 11 | The Biosphere  Biogeochem cycling on land | BCG *Ch5* **153-161;168-171**  BCH *Ch 6* **195-203** | **MIDTERM I**  **MONDAY Rm 028** |
| Oct 19 | 12 |
| 8 | Oct 24 | 13 | Biogeochem cycling on land: N, P, S and metal cycling | BCG *Ch 6* **210-217;**  BCG *Ch 6* **217-225; 230** | Recurrence intervals-DUE |
| Oct 26 | 14 |
| 9 | Oct 31 | 15 | Wetlands: definition, occurrence, reactions | BCG *Ch 7* **233-255** | Wetlands |
| Nov 2 | 16 |
| 10 | Nov 7 | 17 | Wetlands: anaerobic reactions and bioremediation | BCG *Ch 7* **259-273** | Redox reactions |
| Nov 9 | 18 |
| 11 | Nov 14 | 19 | Intro to freshwater chemistry  Lakes and ponds | BCG *Ch 8* **275-288**  BCG *Ch 8* **288-303** | Freshwater |
| Nov 16 | 20 |
| 12 | Nov 21 | 21 | Lakes and ponds  Rivers and streams | BCG *Ch8* **303-308**  BCG *Ch8* **308-312;317-323** | **MIDTERM II MONDAY 028** |
| Nov 23 | 22 |
| 13 | Nov 28 | 23 | Ocean biogeochemical cycles  Review | BCG *Ch 9* **342-365** | Thurs. Nov. 30 Oceans |
| Dec 1 | 24 |

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. Hands-on exercises are used to reinforce concepts. Work not completed during the seminar period much be handed in by the Thursday lecture of the same week.

### Course Assignments and Tests:

[Course Outline Guidelines: Checklist](http://www.uoguelph.ca/vpacademic/avpa/checklist/)

| **Assignment or Test** | **Due Date** | **Contribution to Final Mark (%)** | **Learning Outcomes Assessed** |
| --- | --- | --- | --- |
| Feedback loops | Sept. 14 | 3 | 1,2,3,5 |
| Residence time | Sept. 21 | 3 | 1,2,5 |
| Rock lab | Sept. 28 | 3 | 1,2 |
| Stable isotopes | Oct. 5 | 3 | 1,2,3,5 |
| Recurrence intervals | Oct. 26 | 3 | 1,2,3,5 |
| Midterm 1 | Oct. 16 | 25 | 1,2,3,4,5 |
| Midterm 2 | Nov. 20 | 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:

TBA

### Final exam weighting:

35%

[Examination Regulations](https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-exam.shtml)

## 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.

### Recommended Texts:

### Lab Manual:

### Other Resources:

Any additional reading will be posted on the D2L site for the course. Electronic materials from the lectures and seminars will also be posted on D2L after the lecture only.

### Field Trips:

### Additional Costs:

## Course Policies

### Grading Policies:

[Undergraduate Grading Procedures](https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-grds-proc.shtml)

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:

Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the written permission of the presenter, whether the instructor, a classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

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](https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml).

### 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](https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml).

### 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](https://courseeval.uoguelph.ca/) **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](https://www.uoguelph.ca/registrar/calendars/).

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](https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml).

## 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.