

## GGR403H (2015) Global Biogeochemical Cycles

### **Course Instructor**

Prof. Sharon A. Cowling  
Department of Earth Sciences  
22 Russell Street  
Office: ESC 4113  
Tel. 978-5612  
cowling@es.utoronto.ca  
Lecture: T11-12 (UC-65)  
Office Hours: T12-1 (or by prior appointment)

### **Course Description**

This is a senior undergraduate seminar course with curriculum focusing on the exchange of matter (i.e. elements, minerals) between the Earth's atmosphere, ocean, and biosphere. Course-related topics include global biogeochemical cycling of nitrogen, phosphorous, silicon, iron, nickel, mercury and zinc (amongst other elements) and will include both terrestrial and marine ecosystems. Examples and case studies will be viewed from the paleo-, contemporary and potential future global change perspectives. The overall content of course readings will be determined by student interest, as students have the freedom to choose topics (readings) of personal interest.

### **Student Evaluation**

Student evaluation will be based on the following components:

Selection of article (due: Jan 15)	5%
Introductory notes for class (due: Jan 27)	10%
Introductory presentation	10%
Thesis Statement/References (due: Feb 10)	10%
Research (Data) Presentation	25%
Participation (attendance [8%]/class discussion[7%])	15%
Paper Outline (due: Mar 24)	25%

All assignments are due at 10 am on the day indicated above. Late penalties will apply after 10 am and are 10% per day including holidays and week-ends. No assignment will be accepted one week after the deadline. **PLEASE NOTE:** This is a communications-based course so lecture attendance is mandatory in order to receive the full 10-marks for in-class participation. Initiation of in-class discussion and posing of questions related to the readings are also mandatory for full participation marks. If you are a student who tends to miss lectures on a regular basis or do not like to speak up in class, this course is not for you. Doctor's notes can excuse lateness of assignments but cannot make up for lost (in-class) participation time.

### **Required Readings**

Mandatory readings (published research articles) to be determined by class participants. For your convenience, these articles will be posted on Blackboard.

## Mark Breakdown & Description of Assignments

### **Selection of Research Article (5%):**

I shouldn't have to assign marks for simply choosing an article to present to the class, but I find that students have a tough time making their decision if there are no time constraints placed on making that decision. Therefore, if you choose your article by the deadline, you will get 5/5 on the first assignment. If you do not choose an appropriate article by the deadline, you will receive 0/5 on your first assignment.

### **Introductory Presentation (10%):**

Rather than having you present your entire article in one go (introductory + research findings), I've decided to break it into two parts for several reasons. (1) Students will hear background information about the topic before reading the more difficult data/results section of the paper. Students will also have introductory notes containing definitions of some of the more important topics presented in the article. (2) Students are generally nervous giving presentations and from past experience, when two presentations are given, all students say how much easier the second presentation went relative to the first. Practice makes perfect, so getting experience talking in front of peers is a good thing.

What to include in your Introductory Presentation? The presentation is short, only 10-minutes long. If you use the "1-minute per slide" rule for Power-Point presentations, then your entire presentation should be less than 10 slides. Some of the things that you can present include an explanation of the biogeochemical cycle(s) involved in the paper, description of some of the more important processes that students may not have come across before, introduction to the organism(s) or element(s) being discussed in the article, or you can set up the case for your article by describing the prevailing thinking ("paradigm") at the time the article was published. The only thing to avoid is a discussion of any of the results/findings as this will be the focus of your second presentation.

Sometimes the best way to improve a skill is to evaluate that skill in others. Thus, your first presentation mark will be determined by your classmates. On the second day of class, we will go over the criteria of a good presentation (so that you know how you will be marked by your peers). Each student will evaluate every presentation and so I will take an average of the marks received for your presentation. The mark will be accompanied by comments and suggestions for making your next presentation better than your first. I will be marking the main (data) presentation.

### **Preparation of Introductory Notes to class (10%)**

These notes should be LESS than 2-pages long (including figures) and contain some of the important points discussed in your short introductory presentation. Essentially, all definitions and descriptions of mechanisms should be included in your introductory notes. The idea is that when the student comes to reading your article, if they come across a word that they do not know or a process (mechanism) in which they are unfamiliar then your introductory notes should allow them to better understand the research article before in-class discussion. If you include a figure in your introductory notes, then it MUST be properly explained in the text.

### **Research (Data) Presentation (25%)**

Your second presentation will focus on the results and data discussed in your research paper. You do not need to re-do your introductory presentation, just remind us what the purpose of the research was and then go to it. This presentation should also be about 10-minutes long and will be followed by a question period where students can ask questions about the paper you presented. I will be timing the presentations and will let you know when the 10-minute mark is up. You will have an additional 2-minutes to wrap up the presentation. This means that it is a good idea to practice your presentation before you give it as you won't know how long it is and don't want to be only half way through your presentation when I ask you to stop. All of that day's presenters will go up to the front of the class and form a Question Panel (this way you are not up alone having questions fired at you from every side. You will have colleagues beside you in the same position. The mark for your presentation will also include the way in which you handle questions. If you do not know the answer to the question you can put it out to the rest of the class to answer (as someone may have more specialized knowledge based on their major/specialist program). I will provide the marks and comments for this assignment.

**Thesis Statement/References (10%)**

On the second day of class we will discuss what makes a strong thesis statement and go over some of the statements made by students in previous years. A thesis statement is both timely and highly controversial so the references that I will ask you to provide in addition to your thesis statement will need to be recent (older than 2010) and must be PRIMARY research articles. Your thesis statement should NOT be related to the article that you will be presenting in class.

**Paper Outline (25%)**

The hardest part to preparing a good term paper is to have a solid paper outline. A paper outline will keep your ideas organized and will be arranged in order from the weakest point in favour of your thesis to the strongest argument in favour of your thesis. You will need to have a title to the outline, with the thesis statement the only full sentence in your outline. Your outline will contain sub-headings and ideas presented in point form (absolutely NO full sentences) with the source of that information cited at the end of the point (i.e. Cowling 2012). There will be NO figures in your outline. You will need to present at least 15 PRIMARY research articles and an additional 5 secondary research articles. Citations from textbooks and/or class notes are unacceptable. On the second day of class, we will discuss the difference between a primary and secondary research article and will discuss the library database that I want you to use for this assignment (i.e. "Web of Knowledge").

**Participation (15%)**

Because this is a seminar course, it is assumed that you will come to class prepared (having read the articles that will be discussed that week) and be able to pose questions of the speakers. Your participation will be made up of your attendance at each of the classes as well as how often you speak up in class. I will be keeping notes of who asks questions and so if you remain silent all semester, do not expect a participation mark higher than 8/15. You may get 8/8 for attending most of the lectures but will receive a 0/7 for in-class participation. It is this portion of the marks that students find hard to keep high and can make the difference between an A or B+ grade or between A+ and A grade. In some cases, a zero in this portion of the mark has brought student marks down into the low to mid-60's.