



WINTER 2021

EES1127H GRADUATE COURSE OUTLINE:
 APPLIED BIOGEOCHEMISTRY AND GEOMICROBIOLOGY

Biogeochemical principles and their applications for sustainable ecosystem restoration

Thursdays 9-11am

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COURSE DESCRIPTION

Most environments have experienced dramatic shifts in their functions due to anthropogenic pressure. Techniques for successfully restoring these functions are based upon our knowledge of biogeochemical processes in ecosystems. In this course, the fundamental principles of biogeochemistry will be presented and discussed from an ecosystem degradation and restoration perspective, and this will be enhanced through the examination of case studies. Special focus will be placed on sustainable ecological technologies that aim to mimic natural phenomena, e.g., biomineralization.

COURSE OBJECTIVES

This course will provide students with the biogeochemical principals and the information about the application of these principals for ecosystems restoration. One of the objectives is to enhance work group, students will work in groups, to prepare their presentations and an individual report on any topic of their choice.

SCHEDULE

TENTATIVE COURSE OUTLINE

Date	Week	Topic	Lecture
Jan-13	1	• Introduction and course orientation	MD
Jan-20	2	• Degradation and sustainable restoration of aquatic systems and soil	MD
Jan-27	3	• Case studies: Sustainable restoration of aquatic systems and soil	Working groups Quiz 1
Feb-3	4	• Group's presentations: Aquatic systems and soils sustainable restoration	Students presentation
Feb-10	5	• Sustainable development of energy resources	Tentative: Dr. J. Markard (ETH Switzerland)
Feb-17	6	• Working groups on case studies: sustainable restoration of concrete construction	Working groups/ Quiz 2
Feb-24		READING WEEK	
March-3	7	• Group's presentations: sustainable development of energy resources	Students presentation
March-10	8	• Biomineralization and biochar: their applications for sustainable restoration	MD Dr. S. Alam
March-17	9	• Working groups on case studies of biomineralization and biochar: their applications for sustainable restoration	Quiz 3
March-24	10	• Group's presentations: biomineralization and biochar: their applications for sustainable restoration	Students presentation
March-31	11	• Sustainable development of mining resources	Tentative: Dr. H. Sangam Report (1 page)
Apr-7	12	• Resources and Sustainable Development/Course overview/	MD

ASSIGNMENTS AND EVALUATION

Evaluation will be carried out in accordance with the Graduate Grading and Evaluation Practices Policy (and how that policy is interpreted and applied in this Dept.)

Quiz 1	10%
Quiz 2	10%
Quiz 3	10%
Presentation	40%
Report	30%

EMERGENCY PLANNING

Students are advised to consult the university's preparedness site (<http://www.preparedness.utoronto.ca>) for information and regular updates regarding procedures relating to emergency planning.

ACCESSIBILITY NEEDS

The University of Toronto is committed to accessibility. If you require accommodations for a disability, or have any accessibility concerns about the course, the classroom or course materials, please contact The UTSC Accessibility Services as soon as possible:

<http://www.utsc.utoronto.ca/~ability/>

We also suggest you also refer to the following University of Toronto Scarborough Library link:

<http://utsc.library.utoronto.ca/services-persons-disabilities>

PLAGIARISM

University of Toronto code of Behaviour on Academic Matters states that "it shall be an offense for a student knowingly: to represent as one's own any idea or expression of an idea or work of another in any academic examination or term test or in connection with any other form of academic work, i.e., to commit plagiarism."

For accepted methods of standard documentation formats, including electronic citation of internet sources please see the UofT writing website at:

<http://www.writing.utoronto.ca/advice/using-sources/documentation>

The full Code of Behaviour regulations could be found from consulting

<http://www.sgs.utoronto.ca/facultyandstaff/Pages/Academic-Integrity.aspx>

The University of Toronto has a site license that enables all faculty and students to use Turnitin.com (<http://www.turnitin.com/>), a plagiarism prevention system. For more information on this service please consult <http://teaching.utoronto.ca/ed-tech/teaching-technology/turnitin/> and **students must be informed at the start of the course** that the instructor will be using Turnitin.com. The course syllabus must include the following statement:

Please note: the above statement cannot be altered in any way.

WRITING AND ENGLISH LANGUAGE

As well as the faculty writing support, please see English Language and writing support at University of Toronto: <http://www.sgs.utoronto.ca/currentstudents/Pages/English-Language-and-Writing-Support.aspx>

Students have commented that they found the latter address extremely helpful for writing term papers.

The following are also useful:

Sylvan Barnett, *A Short Guide to Writing About Art*. 5-7th edition (New York: Harper-Collins, 1997)

William Strunk Jr., E.B. White. *The Elements of Style* (New York: MacMillan Publishing)

LATE WORK

If you know that you will miss a deadline then please let me know in advance, as we might be able to work something out. Should you miss a deadline for any term work you will be automatically penalized **10% per day (including weekends)** if you do not follow the following procedure and receive consideration. Within **one week** of the missed deadline you must submit a completed **University of Toronto medical certificate** (available on BB in Course Documents) as well as a **letter from you** describing when you fell ill, how it prevented you from making the deadline and when you returned to school as well as your name and student number and the course code. Submit the certificate and the letter to the instructor. Carefully following this process will allow us to properly consider you for consideration regarding your late/missed work.

READINGS

The instructor will post the required references online.

FINAL EXAM DATE (IF APPLICABLE)

No final exam

Academic Integrity

All suspected cases of academic dishonesty will be investigated following procedures outlined in the *Code of Behaviour on Academic Matters*. If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, please reach out to me. Note that you are expected to seek out additional information on academic integrity from me or from other institutional resources (for example, the [University of Toronto website on Academic Integrity](#)).

Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each student's

individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously. The [University of Toronto's Code of Behaviour on Academic Matters](#) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. Potential offences include, but are not limited to:

In papers and assignments:

- Using someone else's ideas or words without appropriate acknowledgement.
- Submitting your own work in more than one course without the permission of the instructor in all relevant courses
- Making up sources or facts
- Obtaining or providing unauthorized assistance on any assignment

On tests and exams:

- Using or possessing unauthorized aids
- Looking at someone else's answers during an exam or test
- Misrepresenting your identity

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