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# BIOL 527

## Paleolimnology and Global Environmental Change

Winter Term (2025)

**LAND ACKNOWLEDGEMENT:** Queen's University is situated on the territory of the Haudenosaunee and Anishinaabek.

**CALENDAR DESCRIPTION:** The main aim of this course is to provide students with a background in studies of long-term environmental change, with a focus on research that is especially relevant to today's environmental problems. Key topics include climatic change, lake pollution, atmospheric deposition of contaminants and related topics. Lake sediment analyses will be highlighted, but other approaches (such as ice cores, tree rings, corals) will also be explored.

**RECOMMENDATION** BIOL 335/3.0.

**PREREQUISITE** Level 4 and registration in a Biology Honours Plan (BIOL-M-BSH, BIOL-P-BSH, BIMA-P-BSH, BIPS-P-BSH, BTEC-P-BSH, EBIO-P-BSH) and a minimum GPA of 2.0 in the Biological Foundations List or permission of the Department.

**LEARNING HOURS** 132 (21L;15S;96P)

<b>Instructor</b>	
<b>Instructor Contact</b>	
<b>Office Hours</b>	Before or after class; or by appointment
<b>TA:</b>	None
<b>TA Contact Information</b>	None
<b>TA Office Hours</b>	None

### Learning Objectives

The overall goals of this course are to: i) provide an overview of the complexity of environmental issues we are facing today, and how long-term paleoenvironmental data can help inform many of these issues; and ii) provide the opportunity to improve your synthesis and communication skills. In order to be a successful scientist (and citizen), you must be able to assimilate information, organize information, and be able to present information effectively in both oral (seminars) and written (final paper) forms. We will try to develop these skills in this course. (Further details are on the course's onQ website)

### Learning Hours

<i>Teaching method</i>		<i>Average hours per week</i>	<i>Number of weeks</i>	<i>Total hours</i>
In-class hours	Lecture	3	7	21
	Seminar	3	5	15
	Laboratory			
	Tutorial			
	Practicum			
	Group learning			
	Individual instruction			
Other	Online activity			
	Off-campus activity			
	Private study	8	12	96
Total hours on task				132

### Course Outline

There is a growing realization that long-term data are vital for understanding many ecological and environmental problems. Unfortunately, such data are rarely available, and so indirect proxy methods must be used. One of the leading approaches for inferring long-term environmental trends is paleolimnology and related paleoenvironmental fields. Paleolimnology is a multi-disciplinary science that uses physical, chemical, and biological information preserved in sedimentary profiles from aquatic systems to reconstruct past environmental conditions. Paleoecological reconstructions of environmental change are being used increasingly in many projects around the world. For example, paleolimnology played a key role in recent international environmental problems, such as lake acidification, eutrophication, and climate change. In addition to lake and ocean sediment-based approaches, this course will also explore a large spectrum of other paleoenvironmental techniques, such as tree-ring (dendrochronology) analyses, ice core, sclerochronology, and so forth.

### Textbooks/Readings

Smol, J.P. 2008. *Pollution of Lakes and Rivers: A Paleoenvironmental Perspective – 2nd Edition*. Blackwell Publishing, Oxford. 383 pp.

The textbook is available at the Queen's Bookstore and freely available on line.

### Grading Scheme

<b>Component</b>	<b>Weight (%)</b>	<b>Date</b>
Seminar 1	15	See course website (onQ)
Seminar 2	25	See course website (onQ)
Participation	10	
Paper	50	See course website (on Q)

## **Grading Method**

As noted on the onQ website with further details regarding this course, late submissions (without cause) will be penalized.

In this course, some components will be graded using numerical percentage marks. Other components will receive letter grades, which for purposes of calculating your course average will be translated into numerical equivalents using the Faculty of Arts and Science Letter Grade Input Scheme. When letter grades are employed, the following scale will be employed for purposes of calculating your course average:

***Arts & Science Letter Grade Input Scheme***

<b>Assignment mark</b>	<b>Numerical value for calculation of final mark</b>
A+	93
A	87
A-	82
B+	78
B	75
B-	72
C+	68
C	65
C-	62
D+	58
D	55
D-	52
F48 (F+)	48
F24 (F)	24
F0 (0)	0

Your course average will then be converted to a final letter grade according to Queen's Official Grade Conversion Scale:

***Queen's Official Grade Conversion Scale***

<b>Grade</b>	<b>Numerical Course Average (Range)</b>
A+	90-100
A	85-89
A-	80-84
B+	77-79
B	73-76
B-	70-72
C+	67-69
C	63-66
C-	60-62
D+	57-59
D	53-56
D-	50-52
F	49 and below

### **Equity, Diversity, and Inclusivity**

Queen's University recognizes that the values of equity and diversity are vital to and in harmony with its educational mission and standards of excellence. It acknowledges that direct, indirect, and systemic discrimination exists within our institutional structures, policies, and practices and in our community. These take many forms and work to differentially advantage and disadvantage persons across social identities such as race, ethnicity, disability, gender identity, sexual orientation, faith, and socioeconomic status, among other examples. In this class I will work to promote an anti-discriminatory, anti-racist and accountable environment where everyone feels welcome. Every member of this class is asked to show respect for every other member.

### **Academic Integrity and Queen's Code of Conduct**

Queen's students, faculty, administrators and staff all have responsibilities for upholding the fundamental values of academic integrity; honesty, trust, fairness, respect, responsibility and courage (see [www.academicintegrity.org](http://www.academicintegrity.org)).

Students are responsible for familiarizing themselves with the regulations concerning academic integrity and for ensuring that their assignments and their behaviour conform to the principles of academic integrity. Please see: <https://www.queensu.ca/artsci/undergraduate/student-services/academic-integrity> Departures from academic integrity include plagiarism, use of unauthorized materials, facilitation, forgery and falsification, and are antithetical to the development of an academic community at Queen's. Given the seriousness of these matters, actions which contravene the regulation on academic integrity carry sanctions that can range from a warning or the loss of grades on an assignment to the failure of a course to a requirement to withdraw from the university.

### **Accommodation Policy, Exam Conflicts, and Other Conflicts**

Queen's University is committed to achieving full accessibility for people with disabilities. Part of this commitment includes arranging academic accommodations for students with disabilities to ensure they have an equitable opportunity to participate in all of their academic activities.

Please familiarize yourself with these policies:

<https://www.queensu.ca/secretariat/policies/senate/academic-accommodations-students-disabilities-policy>

If you are a student with a disability and think you may need academic accommodations, you are strongly encouraged to contact the Queen's Student Accessibility Services (QSAS) and register as early as possible. For more information, including important deadlines, please visit the QSAS website at: <http://www.queensu.ca/studentwellness/accessibility-services/>

Students who feel they need accommodations for disabilities or extenuating circumstances, or have a conflict between exams or other commitments, should consult the Biology Department's website for details about how to proceed (<https://biology.queensu.ca/academics/undergraduate/prepare-yourself/>). In general, the earlier a course coordinator is apprised of an extenuating circumstance, the more likely an accommodation can be made. Students are encouraged to be proactive in anticipating difficulties, when it is possible to do so.

**Copyright**

Course materials created by the course instructor, including all slides, presentations, handouts, tests, exams, and other similar course materials, are the intellectual property of the instructor. It is a departure from academic integrity to distribute, publicly post, sell or otherwise disseminate an instructor's course materials or to provide an instructor's course materials to anyone else for distribution, posting, sale or other means of dissemination, without the instructor's express consent. A student who engages in such conduct may be subject to penalty for a departure from academic integrity and may also face adverse legal consequences for infringement of intellectual property rights.

**Queen's Email**

The university communicates with students via Queen's email. Please check your email regularly to ensure you do not miss important information related to your course.

**Course Feedback**

At various points during the course, you may be asked to take part in a variety of feedback activities, such as surveys and questionnaires. This feedback enables the teaching team to improve the course. All surveys are anonymous and are directly related to activities, assessments, and other course material.