BIOL 527
Paleolimnology and Global Environmental Change

Winter Term (2026)

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.

Instructor	
Instructor Contact	
Office Hours	Before or after class; or e-mail for appointment
TA:	None
TA Contact Information	None
TA Office Hours	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. To be a successful environmental scientist you must be able to read, organize, make connections, and propose novel ways to address complex environmental issues. In any profession, you must be able to present information effectively in both oral and written forms. This course is designed to further develop both oral and written forms of communication.

Learning Hours

Teaching method		*Average hours per week*	*Number of weeks*	*Total hours*
In-class	Lecture	3	4	12
	Seminar	3	8	24
	Laboratory			

	Tutorial			
	Practicum			
	Group learning			
	Individual instruction			
Other	Online activity			
	Off-campus activity			
	Private study	6	12	72
Total hours on task				108

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 ecological or environmental conditions. Paleolimnological 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.

The first part of this course (my lectures) is structured to give you the necessary background on presentation strategies as well as a general introduction to the field of paleolimnology. The remainder of the course is structured to help develop your synthesis, presentation and writing skills. The topics and papers that I have chosen for your first seminar will highlight the various approaches that have been successfully developed over the years in the field of paleolimnology. Your second presentation (and the topic of your major paper) will be a topic of your choice that explores the importance of long-term data in understanding long-term environmental or ecological change.

Textbooks/Readings

Smol, J.P. 2009. Pollution of Lakes and Rivers: A Paleoenvironmental Perspective – 2nd Edition. Wiley-Blackwell Publishing, 396 pp. (https://www.wiley.com/en-ca/Pollution+of+Lakes+and+Rivers%3A+A+Paleoenvironmental+Perspective%2C+2nd+Edition-p-9781444307573)

E-Book: $89.99 or Print: $111.95

Grading Scheme

Component	Weight (%)	Date
Seminar 1	15	See course website
Proposal for second seminar and paper	10	See course website
Seminar 2	25	See course website
Participation	15	
Paper	35	See course website

Grading Method

• 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

Assignment mark	Numerical value for calculation of final mark
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

Grade	Numerical Course Average (Range)
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

Academic Integrity and Queen's Code of Conduct

The following statement on academic integrity builds on a definition approved by Senate and is designed to

make students aware of the importance of the concept and the potential consequences of departing from the core values of academic integrity. It is highly recommended that this statement be included on all course syllabi. Instructors may also consider including this statement with each assignment.

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). These values are central to the building, nurturing, and sustaining of an academic community in which all members of the community will thrive. Adherence to the values expressed through academic integrity forms a foundation for the "freedom of inquiry and exchange of ideas" essential to the intellectual life of the University (see the Senate Report on Principles and Priorities http://www.queensu.ca/secretariat/policies/senate/report-principles-and-priorities).

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. Information on academic integrity is available in the Arts and Science Calendar (see Academic Regulation 1 http://www.queensu.ca/artsci/academic-calendars/regulations/academic-regulations/regulation-1), on the Arts and Science website (see https://www.queensu.ca/artsci/students-at-queens/academic-integrity), and from the instructor. 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.

Academic Accommodations - 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 their academic activities. If you are a student with a disability and think you may need academic accommodations, you need to contact the Queen's Student Accessibility Services (QSAS) and register as early as possible (http://www.queensu.ca/studentwellness/accessibility-services/). Typical accommodations may include extra time on assessments and/or special room requirements.

Academic Consideration is mitigation for a short-term issue related to an extenuating circumstance. All academic considerations must go through the student portal available on the Faculty of Arts and Science website (https://www.queensu.ca/artsci/accommodations). There are 2 types of academic considerations. The first is called a 'brief absence' (up to 48hrs) and is essentially a self-declaration of an extenuating circumstance. The second is a short-term extenuating circumstance that can be from 2 days-3 months. The later requires documentation. The aim of centralizing academic considerations is to log extenuating circumstances to provide better support for students who need it, and to watch for patterns where students are abusing the system.

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