

GEOG 3352A/9216A: Paleolimnology and Global Environmental Change Course Outline: Section 001 – Fall 2018

1. Course Information

1.1. Classroom Location:

Lectures: Wednesdays, 10:30am- 12:30pm, SSC 1302

Labs/Tutorials: Thursdays, 10:30am-12:30pm, SSC 1302

Field Trips: **Students are required to attend one field trip held on Sept. 22, from 8:30am-5:30pm. This is a critical and mandatory part of the course and attendance is required.**

1.2. Contact Information:

Instructor: Dr. Katrina Moser

Office: SSC 2407

Office Hours: Thursdays 1-2pm

Phone: 661-2111 x80115

Email: kmoser@uwo.ca

Teaching Assistant: Rebecca Doyle

Office: SSC 1430

Office Hours: Wednesdays 9:30-10:30am

Email: rdoyle25@uwo.ca

The Department of Geography strives at all times to provide accessibility to all faculty, staff, students and visitors in a way that respects the dignity and independence of people with disabilities. Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 519-661-2147 for any specific question regarding an accommodation.

More information about “Accessibility at Western” is available at: <http://accessibility.uwo.ca>

2. Calendar Description

Paleolimnology is the reconstruction and interpretation of past environments using physical, chemical and biological indicators contained in lake sediments. In the last two decades the field of paleolimnology has undergone rapid expansion. This course is a detailed examination of current methods and theories in Paleolimnology.

Lecture topics will include a review of:

- dating methods
- paleolimnological techniques, including a detailed survey of a variety of paleoindicators
- current issues in paleolimnology

- paleolimnology and global environmental change

Labs will provide students with a hands-on experience of field and lab techniques used by paleolimnologists

Prerequisite(s): One of Geography 2310A/B, 2320A/B or 2330A/B, or at least 3rd year standing in an Environmental Science or Earth Sciences program, or Biology 2483A, 2484A, 2485B or permission of the instructor. Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

3. Textbook

Smol, J.P. 2008. *Pollution of Lakes and Rivers: A Paleoenvironmental Perspective Second Edition*. Blackwell Publishing, Oxford.

4. Course Objectives

This course provides students with a “hands-on” learning experience in one area of environmental science, Paleolimnology. Students will learn how research questions and hypothesis are developed and then tested. A one day field trip provides students with the opportunity to survey sites and collect data to test a hypothesis. Typically a sediment core is collected during the field trip, which then provides the basis for the rest of the labs. However, this is dependent on weather. Students will learn to make and record limnologic observations and measurements. Sediments retrieved during the field trip or from previous years, will become the basis for lab assignments. Lectures provide the background materials necessary for understanding and interpreting the data collected by students

Here are content and technical goals for this course:

Content

The main content objectives of this course are:

1. to provide students with an understanding of the importance of a long-term perspective in environmental research;
2. to provide students with a strong foundation and understanding of the most recent theories and methodologies in Paleolimnology;
3. to provide students with an understanding of the contributions of Paleolimnology to our understanding of global environmental change

Technical

The main technical objectives of this course are:

1. to provide students with an understanding of the scientific method
2. to provide students with an opportunity to make field observations and measurements and

assess the accuracy and precision of the measurements

3. to provide students an opportunity to use the observations to test hypotheses

4. to provide students with an overview of paleolimnological techniques and an opportunity to practice these techniques.

Classes

There will be one 2 hour lecture and one 2 hour lab per week. One mandatory Saturday field trip as previously mentioned.

5. Evaluation

There will be five components to students' evaluation:

1. Paleoindicator Poster Presentations (20%)

Students will be required to make a poster presentation (~10-15 minutes) about a paleoindicator of their choice (excluding diatoms). Students will work individually or in pairs. Paleoindicators which may be selected include Chrysophycean algae, chironomids, Cladocera, molluscs, Protozoa, freshwater sponges (Porifera), freshwater ostracodes, phytoliths, biogeochemical signals (e.g. algal pigments, biogenic silica), charcoal, elemental geochemistry, contaminants, sedimentary characteristics, etc. Students must consult with Dr. Moser about their choice of paleoindicator. Further information, including a grading rubric, will be provided when the project is assigned.

2. Field and Lab Exercises (30%)

During the class a field trip will be held in the London area. We will work from small boats and float tubes to collect a sediment core, which will form the basis of subsequent lab exercises. Short lab assignments will introduce students to a variety of paleo techniques including some of the following, site selection, field methods, sediment dating, core analyses, subsampling and pollen, diatom, loss-on-ignition, chryosphyte and charcoal analyses. Attending and actively participating in field trips and labs is critical to your success in the course. Labs will not all be weighted equally, and weightings are provided on the attached schedule along with lab due dates.

3. Quizzes (20%)

There will be two quizzes during the course each worth 10%. Quizzes will be comprised of multiple choice, fill in the blank and short answer questions. No electronic devices will be allowed during quizzes. The quiz is to ensure you are learning the necessary material required for the final oral exam.

4./5. Final Presentation (10%) and Oral Exam (20%)

The final exam will be a 20 minute oral exam. Students will be given a research question the first class after the field trip and will use data collected during the ensuing labs to work towards formulating an answer to the question. For the final exam students will be required to make a five minute presentation on their findings. This will be followed by 15 minutes of questions.

Both myself and the TA, Rebecca Doyle, will be at the exam and will ask questions. **The oral exam will occur during the exam period well.**

Evaluation Component	Percentage of Course Grade	Due Date
Lab 1: thermal Stratification	10%	October 4
Lab 2: Dating and LOI	10%	November 15
Lab 3: Microscopes, Diatoms and Chrysophytes	5%	November 15
Lab 4: Pollen	5%	November 22
Poster Presentation	20%	October 25
Quiz 1	10%	October 18
Quiz 2	10%	November 29
Final Presentation	10%	Exam Period: Dec 10-21
Final Oral Exam	20%	Exam Period: Dec 10-21

Evaluation for those registered in Geography 9216B will be the same as above, but will include a written report (to be determined in discussions with Katrina Moser). Lab assignments will only be worth 10% and the written report 20%.

You are expected to attend all lectures, labs/tutorials, and the field trip, and to complete the assigned readings. There are no exceptions to this. Extra assignments to improve grades **will NOT** be accepted.

6. Electronic Devices

No calculators will be required or permitted in the exams. Students who require electronic assistance with language translation must obtain prior approval from the instructor.

7. Academic Penalties/Offences

Exams: In accordance with university policy, missed exams cannot be made up except on written medical grounds and notification prior to exam date.

Assignments: Late assignments will have a penalty of 10% per day. Assignments submitted more than 1 week late will not be accepted. Exceptions can be made for documented medical and other significant reasons beyond your control (see subsequent sections).

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

“Computer-marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

8. Non-Medical Absences

Non-medical absence from the midterm requires prior approval of the instructor or approval by the Dean’s office (appropriate documentation will be required by the Faculty Dean’s Office for approval if it is not obtained at least one week prior to the midterm).

9. Medical Absences

Students seeking academic accommodation on medical grounds for any missed tests, exams, participation components and/or assignments worth more than 10% of their final grade must apply to the Academic Counselling office of their home Faculty and provide documentation. Academic accommodation cannot be granted by the instructor or department.

For UWO Policy on Accommodation for Medical Illness and a downloadable SMC see:
http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf

Downloadable Student Medical Certificate (SMC):
http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf. When medical illness affects work worth less than 10% of the total course grade (i.e. an assignment), please contact the course instructor for academic accommodation (documentation not required).

If you feel that you have a medical or personal concern that is interfering with your work, you should contact your Instructor, Graduate Program Administrator, Supervisor, or SGPS.

10. Make-Ups

Students with special accommodation will write make-up tests and examinations administered by the department on Fridays during respective periods of fall and winter terms. To prevent prior disclosure, the format and contents of make-ups may differ substantially from the scheduled test or examination.

11. Scholastic Discipline for Graduate Students

For the complete policy and regulations see:
http://grad.uwo.ca/current_students/regulations/13.html

12. Procedures for Appealing Academic Evaluations

Students may appeal an academic decision or ruling in accordance with the appeal procedures set out below. Students have a right to appeal to their graduate programs and, if unsuccessful, to the Vice-Provost (Graduate and Postdoctoral Studies). Some decisions may be appealed further to the Senate Review Board Academic. The Vice-Provost’s rulings in academic matters are final unless overturned or modified on appeal to the Senate Review Board Academic (SRBA).

For the complete policy and regulations see:
http://grad.uwo.ca/current_students/regulations/13.html

13. Support Services

Student Support Services can be reached at: <http://westernusc.ca/services/>

Student Development Services can be reached at: <http://www.sdc.uwo.ca/>

Students who are in emotional/mental distress should refer to Mental Health@Western
http://www.health.uwo.ca/mental_health/ for a complete list of options about how to obtain help.

14. Other Information

For a list of Graduate Regulations please visit:
http://www.grad.uwo.ca/current_students/regulations/index.html

For The University of Western Ontario Senate Regulations, please see the Handbook of Academic and Scholarship Policies at:
http://www.uwo.ca/univsec/academic_policies/index.html

15. Course Schedule

Dates	Subject	Reading, Assignment, Notes
Sept 12	Lecture 1: Course Introduction What is Paleolimnology?	Smol, Chapter 2
Sept 13	Lecture 2: Water	Field Trip Introduction
Sept 19	Lecture 3: Thermal Stratification and Redox	Smol, Chapter 1
Sept 20	Lecture 4: Lakes and Sediments Field Work and Note Taking	Smol, Chapter 3 Field Trip Preparation
Sept 22	Field Trip 8:30am-5:30pm	
Sept 26	Lecture 5: Dating	Smol, Chapter 4
Sept 27	Lab 1: thermal Stratification	Due: Oct 4 (10%) Final Presentation Question
Oct 3	Tutorial – poster presentations assigned and help with Lab 1	Poster Paleoindicator Assigned (20%)
Oct 4	No class, but Lab 1 is due	Lab 1 Due
Oct 8-12	Fall Reading Week	
Oct 17	Lecture 6: Paleoindicators	Smol, Chapter 5 and 6
Oct 18	Quiz 1	Quiz 1 (10%)

Dates	Subject	Reading, Assignment, Notes
Oct 24	Poster prep	
Oct 25	Poster Show	Poster Presentation Due
Oct 31	Lecture 7: Erosion	Smol, Chapter 12
Nov 1	Lab 2: Dating and Loss-On-Ignition	Due: Nov 15 (10%)
Nov 7	Lecture 8: Atmospheric Pollution and Acidification	Smol, Chapter 7 and 8
Nov 14	Lecture 9: Eutrophication	Smol, Chapter 11
Nov 15	Lab 3: Microscopes, diatoms and chrysophytes	Lab 2 Due Lab 3 Due (5%)
Nov 21	Lecture 10: Climate Change	Smol, Chapter 14
Nov 22	Lab 4: Pollen, Vegetation and Climate	Lab 4 (5%)
Nov 28	Lecture 11: Biodiversity, Species Invasions and Expirations	Smol, Chapter 13
Nov 29	Quiz 2	Quiz 2 (10%)
Dec 5	Lecture 12: The Future	Smol, Chapter 15, 16, 17
Dec 6	Class Wrap Up	