

Paleontology

ERTH 2312

Instructor: Joanna Northover (She/They)

Department: Earth Sciences

Email: joanna.northover@carleton.ca - Please include EARTH 2312 in the subject line

Office Hours: Thursdays 1:00-2:00pm in Rm 2115 HB (Hertzberg Laboratories),
or virtually by appointment on Zoom

Class Times: Mondays, 2:35pm – 4:25pm

Location: Rm 446 TB (Tory Building)

Brightspace: <https://brightspace.carleton.ca/d2l/home/221793>

Lab Times: Tuesdays 2:35-5:35pm (Sect. A); OR Fridays, 8:35-11:25am (Sect. B)

Lab Location: Rm 2130 HB (Hertzberg Laboratories)

T.A.'s: Conrad Wilson (CONRADWILSON@carleton.ca)

Caelan Libke (CAELANLIBKE@carleton.ca)

Course Description: Introduction to macrofossil and microfossil groups, their paleoenvironmental significance, and principles of evolutionary paleoecology.

Prerequisite(s): EARTH 1006 and EARTH 1009 or GEOG 2013. Prerequisites additional credit for EARTH 2316, GEOL 2301 and GEOL 2306.

Learning Outcomes:

- Understand how the science of paleontology developed and the various methods it uses to reconstruct and interpret Earth's history.
- Identify major macro- and micro-fossil groups and recognize, and interpret the function of, their distinguishing morphological features.
- Interpret the age of a rock/stratigraphic unit and its depositional environment using fossil assemblages.
- Understand how macro- and micro-fossils can be paleoclimatic and paleoenvironmental indicators, and organisms' interrelation with their environment (paleoecology).
- Understand and describe the Theory of Evolution, how it was developed, and how it has led to the patterns of diversity over geologic time (e.g. punctuated equilibrium, background extinctions, mass extinctions, etc.)
- Interpret the taphonomic history and paleoecology of fossils, or fossil assemblages.
- Practice scientific research, writing, and adhering to formatting guidelines by producing a written paper on a specific paleontological topic (chosen by the student)
- Practice communicating science to a general audience by producing an educational video on a specific paleontological topic (chosen by the student)

Tentative Course Schedule*:

WEEK	DATE	LECTURE TOPIC	READINGS	LAB TOPIC
1	Jan 8	Course Introduction What is Paleontology?	Ch 1 & 2	No Labs
2	Jan 15	The Nature of the Fossil Record Taphonomy	Ch 5 & 20	Taphonomy & Trace Fossils
3	Jan 22	Evolution Systematics	Ch 7	Cladistics and Taxonomy
4	Jan 29	The Origin of Life, Protists Diversity & Extinction	Ch 9 & 10 Ch 8	Micropaleontology
5	Feb 5	Paleoecology Limiting Factors	Ch 4	Fossil Identification
6	Feb 12	Midterm Exam	----	Sponges & Coral
7	Feb 19	Family Day & Winter Break – NO CLASS	----	Winter Break – NO CLASS
8	Feb 26	Porifera Cnidarians (Sponges & Corals) Modern Reef structure	Ch 11 & 12	Brachiopods & Bryozoa
9	Mar 4	Lophophorates (Brachiopods & Bryozoans) Mollusca	Ch 13 & 14	Bivalves, Gastropods, & Cephalopods
10	Mar 11	Phanerozoic Reef Succession Arthropoda	Ch 15	Arthropods
11	Mar 18	Echinodermata Chordata	Ch. 16, 17 & 18	Echinoderms
12	Mar 26	Video Presentations & Discussions	----	Review lab
13	April 1	Video Presentations & Discussions (Easter Monday – University is open)	----	Lab Exam
14	April 8	Video Presentations & Discussions	----	<i>Lab Sect. A Tues. Lab - Extra Video Presentation Slots</i>

* Lecture topics may change or be adjusted during the term. See Brightspace for updates.

Learning Materials:

Textbook (required): M. Benton & D. Harper (2020) *Introduction to Paleobiology and the Fossil Record*; 2nd Edition

Physical copies are available for purchase at the Carleton Bookstore, and a copy of the textbook is available on a 4 hour hold at the Carleton MacOdrum Library.

Technology Checklist:

- ☐ An internet-enabled computer (laptop/desktop)
- ☐ Access to reliable internet
- ☐ Webcam – OR – smart phone – OR – digital camera (for recording video)
- ☐ Headset with microphone (an asset, but not required)

Grading Breakdown:

Lecture Midterm	15%	(February 12, 2024 , held in class)
Lecture Final Exam	30%	(During formal exam period, date TBA)
Class Participation	5%	(Poll Everywhere, + video screening and discussion attendance)
Term Project	20%	(10% written assignment, 10% video presentation)
Lab Assignments	20%	(Weekly Lab assignments)
Lab Exam	10%	(April 1, 2024 , held during Lab time)

Standing in a course is determined by the course instructor subject to the approval of the Faculty Dean. This means that grades submitted by the instructor may be subject to revision. No grades are final until they have been approved by the Dean.

Assessments:

Exams:

The lecture midterm exam will be held in-person on **February 12, 2024**, during class time and is closed book. The midterm will cover material from week 1-4. The final exam will cover material from weeks 5 – 14 (including questions based on class video presentations). The final lecture exam will be closed book and will be held in-person during the final exam period.

Class participation:

Participation will be scored for lecture attendance using Poll Everywhere. Question will be shown each lecture, and responding to these polls will count towards your 4% participation grade – 80% of the participation grade will be awarded for submitting a response, and 20% for responding with the correct answer. The lowest Poll Everywhere grade will be dropped, to account for unexpected absence during the term. Poll Everywhere questions will begin to officially count towards the final grade in week 3, to allow time for students to register for a Poll Everywhere account and any late registrations to the course. The final 1% of your participation grade will be for attending the video presentation days.

Lab:

For more detailed description of Lab activities, required materials, evaluations, policies, and procedures please see the **Lab Outline/Syllabus on Brightspace**.

Term Project:

The term project consists of a written assignment and video presentation worth 20% of the final grade. Your project topic must be **selected** and **approved** before **February 16, 2024**. The video presentation is to be submitted electronically by **March 22, 2024** and will be screened and discussed during class time. The written assignment is due **April 8, 2024**. Both portions of the assignment will be submitted online through their respective Brightspace assignment portals.

*For more detailed project information and instructions refer to the **Project Outline** and **Project Rubrics** posted on Brightspace.*

Academic Accommodations, Regulations, etc.:

ACADEMIC ACCOMMODATIONS

You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

Informal accommodation due to short-term incapacitation

Conflicts with any course requirement (labs, midterm exam, project deadline, etc.) due to illness or otherwise **MUST** be reported to the instructor and/or the Laboratory TA prior to the due date when possible. If this is not possible, contact regarding a deferral/accommodation must be made within **24 hours of the missed deadline**.

Missed lectures

If you are sick, or have been exposed to COVID 19, please do not come to class in person! All lecture slides will be uploaded to Brightspace weekly and any questions about the material can be answered during office hours. You are **not** required to notify the Instructor if you missed a lecture, as 1 or 2 absences will not affect your participation grade. For a prolonged absence from lecture, it is recommended to contact the instructor for accommodation.

COVID-19/respiratory illness

Carleton University has suspended the need for a doctor's note or medical certificate until further notice when requesting academic accommodation related to COVID-19. Students should complete the self-declaration form available on the Registrar's Office website to request academic accommodation (<https://carleton.ca/registrar/wp-content/uploads/self-declaration.pdf>). Note that the timing for submitting a self-declaration to your instructor is the same as outlined in the "**Informal accommodation due to short-term incapacitation**" section above.

Late assignments

Late assignments or course work, without written accommodation by the instructor or TA, will be penalized 10% per day for the first 5 days, and after 5 days will receive a mark of 0%.

Missed final exam

The policy for deferring a final exam is the same as the "**Informal accommodation due to short-term incapacitation**" section above. With the exception that you **must** follow the instructions on the Registrar's website for Deferred Exams which can be found here:

<https://carleton.ca/registrar/deferral/>.

Pregnancy obligation

Write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For accommodation regarding a formally-scheduled final exam, you must complete the Pregnancy Accommodation Form <https://carleton.ca/equity/contact/form-pregnancy-accommodation/>

Religious obligation

Write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details <https://carleton.ca/equity/focus/discrimination-harassment/religious-spiritual-observances/>

Academic Accommodations for Students with Disabilities

The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, please request your accommodations for this course through the [Ventus Student Portal](#) at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (*if applicable*). Requests made within two weeks will be reviewed on a case-by-case basis. For final exams, the deadlines to request accommodations are published in the [University Academic Calendars](#). After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website for the deadline to request accommodations for the formally-scheduled exam (if applicable).

Survivors of Sexual Violence

As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and where survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: <https://carleton.ca/equity/sexual-assault-support-services>

Accommodation for Student Activities

Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation will be provided to students who compete or perform at the national or international level. Write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. <https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf>

PLAGIARISM

The University Academic Integrity Policy defines plagiarism as “*presenting, whether intentionally or not, the ideas, expression of ideas or work of others as one’s own.*” This includes reproducing or paraphrasing portions of someone else’s published or unpublished material, regardless of the source, and presenting these as one’s own without proper citation or reference to the original source. Examples of sources from which the ideas, expressions of ideas or works of others may be drawn from include but are not limited to: books, articles,

papers, literary compositions and phrases, performance compositions, chemical compounds, artworks, laboratory reports, research results, calculations and the results of calculations, diagrams, constructions, computer reports, computer code/software, material on the internet and/or conversations.

Examples of plagiarism include, but are not limited to:

- any submission prepared in whole or in part, by someone else, including the unauthorized use of generative AI tools (e.g., ChatGPT);
- using ideas or direct, verbatim quotations, paraphrased material, algorithms, formulae, scientific or mathematical concepts, or ideas without appropriate acknowledgment in any academic assignment;
- using another's data or research findings without appropriate acknowledgement;
- failing to acknowledge sources through the use of proper citations when using another's work and/or failing to use quotations marks.

Plagiarism is a serious offence that cannot be resolved directly by the course's instructor. The Associate Dean of the Faculty conducts a rigorous investigation, including an interview with the student, when an instructor suspects a piece of work has been plagiarized. Penalties are not trivial. They can include a final grade of "F" for the course.

Assistance for Students

Statement on Student Mental Health

As a University student you may experience a range of mental health challenges that significantly impact your academic success and overall well-being. If you need help, please speak to someone. There are numerous resources available both on- and off-campus to support you. For a list of resources available to you visit (<https://carleton.ca/wellness/>)

Other Helpful Student Resources

Academic and Career Development Services: <http://carleton.ca/sacds/>

Writing Services: <http://www.carleton.ca/csas/writing-services/>

Peer Assisted Study Sessions (PASS): <https://carleton.ca/csas/group-support/pass/>

Math Tutorial Centre: <https://carleton.ca/math/math-tutorial-centre/>

Science Student Success Centre: <https://sssc.carleton.ca/>