

J. Northover

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Earth System Through Time
ERTH 1009

Instructor: Joanna Northover (joanna.northover@carleton.ca)
Lectures: Mondays & Wednesdays, 4:35-5:55pm, River Building, Rm 2200

Lab Coordinator: Dr. Geoff Pignotta (geoff.pignotta@carleton.ca)
Labs: Hertzberg Building, Rm 2110 (see your enrolled section for dates/times)

Course Description:

Origin and co-evolution of Earth and life over its 4.56 billion year history. Connections between plate tectonics, rock formation, climate and global change. Early marine life, colonization of land, mass extinctions, and the use of fossils for interpreting past ecosystems.

Course Objectives:

Understand how the earth works as a system. Understand why the earth and life are as they are today. Understand, and discuss, current major hypotheses about the origin of the universe, earth and life. Realize the co-evolution, and interactions, between earth and life. Understand biological evolution, diversity of life, and extinction. Know chronology of major events in the history of life.

We will **describe the components of the system**, **how those components interact**, and then **reconstruct the history of Earth**.

Lecture Schedule:

- Week 1: [Lecture 1 – Introduction](#)
[Lecture 2 – Origin of the Solar system, Earth and moon](#)
- Week 2: [Lecture 3 – Plate tectonics](#)
[Lecture 4 – Earth materials](#)
- Week 3: [Lecture 5 – Rock cycle and sedimentary facies](#)
[Lecture 6 – Atmosphere and hydrosphere](#)
- Week 4: [Lecture 7 – Dating, time sequences](#)
[Lecture 8 – Origin of Life and fossils](#)
- Week 5: [Lecture 9 – Classification and Systematics](#)
[Lecture 10 – Diversity](#)
- Week 6: [Lecture 11 – Evolution](#)
[Lecture 12 – Extinction](#)
- Week 7: WINTER BREAK (no classes)
- Week 8: [Lecture 13 – Life environments](#)
[Lecture 14 – Biogeochemical processes](#)

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- Week 9: Lecture 15 – Hadean and Archean
 Lecture 16 – Proterozoic
- Week 10: Lecture 17 – Cambrian explosion
 Lecture 18 – Paleozoic oceans
- Week 11: Lecture 19 – Paleozoic land
 Lecture 20 – P-T Extinction
- Week 12: Lecture 21 – Triassic recovery
 Lecture 22 – Cretaceous
- Week 13: Lecture 23 – K-T Extinction, Cenozoic
 Lecture 24 – Ice Age and the end
- Week 14: Exam Review

Learning outcomes:

By the end of this course, you will be able to: 1) understand and interpret evidence for the origin of the Universe, Earth, and Life, 2) describe various Earth processes, 3) integrate the evolution of Earth and Life, 4) implement observations and infer past environments, 5) recall major events in the history of Earth and Life.

Mark breakdown:

Midterm – 20%

Lab activities – 40% (30% labs, 10% lab exam)

Final lecture exam – 40%

Textbook (recommended)

“Earth System History” by Stanley – the text is highly recommended, as much course content is covered in this textbook. The book is also a good resource for the lab.

Midterm:

An in-person midterm will take place on **TBD** (Scheduled by Examination Services).

The exam will cover week 1-6 (lectures 1 to 12).

Policies and Procedures:

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. In case of instructor illness, inclement weather, or other unforeseen emergency circumstances, lectures will be held virtually through Zoom. An announcement of the change will be made through Brightspace and email as soon as possible.

Please, check Brightspace often for important announcements and course updates!

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Instructor Office Hours: Thursdays 11:35-12:35pm in 2118 HB or by appointment through Zoom. Please, email to arrange a virtual meeting with Joanna.

Conflict with course requirements (Labs, Quizzes, Midterm, etc.): A Students with conflicts for ANY course requirement (lab, quiz, exam, etc.) due to illness or otherwise MUST be reported to the instructor, or Lab Coordinator, PRIOR to the due date when possible. If this is not possible contact regarding a deferral must be made within 24 hours of the deadline.

Note regarding COVID-19: 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. Note that the timing for submitting a self-declaration to your instructor is the same as outlined in the Conflicts with Course Requirements section above.

Missed final exam: The policy for deferring a final exam is the same as Conflicts with Course Requirements 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/>.

Lab: Labs begin January 17, 2023. See the "Lab schedule" below for more information. Dr. Geoff Pignotta will oversee all issues concerning the completion of activities related to labs. Your TAs may also be able to assist you during their office hours.

Lab assignments: Lab assignments are handed in at the end of each lab session. Late lab assignments will not be accepted. For missed labs please follow instructions in the Conflicts with Course Requirements section above.

Academic Integrity:

Academic integrity is taken very seriously in the Department of Earth Sciences, and Carleton University in general. Refer to the following document for policies and explanations of activities included with academic integrity. <https://carleton.ca/registrar/academic-integrity/>

Some examples of violations that will not be tolerated include:

Plagiarism: submitting work written in part or whole by someone else, failing to acknowledge sources through proper use of citations.

Resubmission: resubmitting work from another or the same course (if repeated).

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Test/exam behavior: attempting to read another student's paper, speaking/messaging with another student during the exam, using material not authorized by examiner.

Improper/unauthorized dissemination: providing access or receiving access to confidential materials (e.g. exam questions), and distribution of course materials.

Violations will be taken very seriously and may involve the Department Chair, and/or the Dean. Sanctions for such violations may include a grade of zero, decreased course grade, remediation, withdrawal from the course, or more.

Requests for Academic Accommodation:

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

Pregnancy obligation

Please contact your instructor 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, visit the Equity Services website: carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf

Religious obligation

Please contact your instructor 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, visit the Equity Services website: carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf

Academic Accommodations for Students with Disabilities

If you have a documented disability requiring academic accommodations in this course, please contact the Paul Menton Centre for Students with Disabilities (PMC) at 613-520-6608 or pmc@carleton.ca for a formal evaluation or contact your PMC coordinator to send your instructor your Letter of Accommodation at the beginning of the term. You must also contact the PMC no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with your instructor as soon as possible to ensure accommodation arrangements are made.

carleton.ca/pmc

Survivors of Sexual Violence

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As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and is 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: carleton.ca/sexual-violence-support

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 must be provided to students who compete or perform at the national or international level. Please contact your instructor 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>

For more information on academic accommodation, please contact the departmental administrator or visit: students.carleton.ca/course-outline

Winter 2023 Laboratory Schedule

Week	Date	Topic
1	01/10-01/13	No Labs
2	01/17-01/20	Discovering Plate Boundaries
3	01/24-01/27	Fieldtrip to Canadian Museum of Nature
4	01/31-02/03	Sedimentary Rocks and Processes
5	02/07-02/10	Principles of Geologic Time
6	02/14-02/17	Invertebrate Fossil Identification and Classification
7	02/20-02/24	Winter Break
8	02/28-03/03	Geologic Maps and Cross-sections
9	03/07-03/10	Weathering, Sediment Transport & Depositional Environments
10	03/14-03/17	Mass Extinction Events
11	03/21-03/24	Vertebrate Fossils and Mass Extinctions
12	03/28-03/31	Global Paleoenvironments
13	04/04-04/12*	Lab Exam

***Note that Friday April 7 is a holiday and that Wednesday April 12 runs on a Friday schedule. Therefore, the lab exam for Friday labs will be held on Wednesday April 12.**