

J. Northover

Joanna.Northover@carleton.ca

## Evolution of the Earth

### ERTH 1011

Instructor: Joanna Northover (joanna.northover@carleton.ca)

Lectures: Monday & Wednesdays, 4:35-5:55pm, Ridgecraft Building, Rm 2200

Lecture office hour: Thursday 11:35-12:35 (Room 2118 HB)

TA: Misha Whittingham (mishawhittingham@cmail.carleton.ca)

#### 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
- Week 9:      Lecture 15 – Hadean and Archean

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	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%

Weekly Quizzes – 40% (10 worth 4% each)

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.

**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 (Quizzes, Midterm, etc.): A Students with conflicts for ANY course requirement due to illness or otherwise MUST be reported to the instructor 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/>.

Missed quizzes: You will have 1 week to complete each weekly quiz. Do not leave them to the last minute! A missed quiz will receive a mark of zero. Missed quizzes will not be permitted to be retaken. Missed quizzes cannot be reopened. If you miss the quiz, you will miss the opportunity to view the questions in the future. Questions about quizzes should be directed to the quiz coordinator, Misha Whittingham.

**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).

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

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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 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](http://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](http://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](mailto: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](http://carleton.ca/pmc)

**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 is survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For

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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](http://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](http://students.carleton.ca/course-outline)