

# Life on Earth

GEOS 170C1

Spring 2020

Lecture

T & TH 12:30 – 1:45 PM

Ctr English Second Lng

Room 102

[\(map\)](#)

**Instructor:** Dr. Ji Yeon Shin

**Email:** [jyshin@arizona.edu](mailto:jyshin@arizona.edu)

**Office:** Gould-Simpson 322 ([map](#))

**Phone:** 520-626-7797

**Office Hours:** M & T 2:00 – 3:00 PM & by appointment

## Teaching Assistant

Katherine Guns

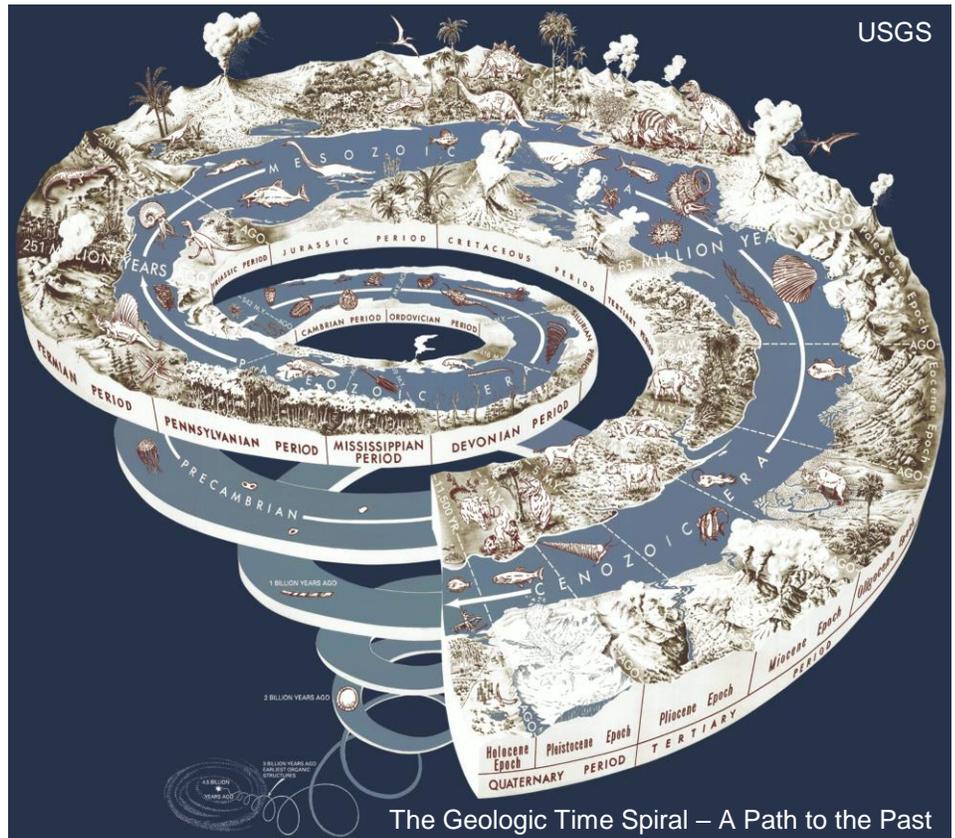
[kguns@email.arizona.edu](mailto:kguns@email.arizona.edu)

Office Hours: by appointment,  
Gould-Simpson 546 ([map](#))

## Importance of Fossils

Fossils are traces of past life and provide invaluable clues to history of life on Earth. Paleontology is the science of studying these fossils. By studying fossils and the rocks they come from, we can understand how life originated and evolved on Earth. The great value of paleontology lies in what it can tell us about ourselves especially our own evolutionary background.

We all care about our future which is a continuation of both our present and past. The fossils record has



shown us five previous worldwide extinction events that occurred before the human era. With knowledge of the past, we can better understand our planet today and make predictions and plans for future.

By the end of the semester, all students in the class should be able to understand how life originated and evolved on Earth, and comprehend evolution and extinction of major fossils and living groups of organisms.

## Course Description & Objectives

**In this course, we explore history of life on Earth as interpreted from the fossil record.**

You will learn about the diversity of life through geological time, including the origin, evolution, and extinction of the major groups. In addition, we will assess impacts of changing environments on the history of life on Earth.

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**Course Website:** <https://d2l.arizona.edu/>

## Required Course Materials:

- Cowen's History of Life 6<sup>th</sup> ed. by Michael J. Benton, Wiley-Blackwell.
- Turning Technologies clicker (supported devices: QT & QT2) – available for purchase in the UA bookstore.

## Expected Learning Outcomes

By the end of the semester, all students in the class should be able to

- Describe how life originated on Earth
- Explain the major evolutionary events in the history of life
- Interpret biodiversity and major extinction events in response to changing environments through geologic time
- Distinguish the characteristics of different groups of both fossils and living organisms, and their evolutionary history

## Clicker Participation

Clickers are interactive student response systems that allow you to participate and find out whether you understand a particular concept in class. Thus, it is important that you remember to bring your clicker with you to class each day, and participate using your clicker throughout the class. **You will also use your clicker in exams.** In order to receive credit for your clicker participation in quizzes and exams, you will need to **register your clicker device on D2L prior to coming to the first class on Thursday, 1/16.** Please check D2L for clicker registration instruction.

The supported clicker devices in this course are QT and QT2 models - shown in the image below.



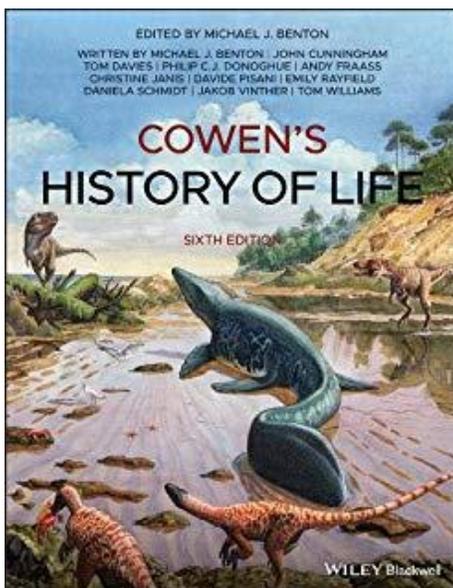
**If you are found using multiple clickers, your clicker(s) will be taken and all involved parties will be ineligible to receive clicker points for the rest of the semester.** Additionally, you would be in violation of the University Code of Academic Integrity and the infraction would be handled according to University Policy.

## Suggestions and Tips on How to Succeed

### Reading

There is one textbook for the course and I strongly recommend you to read the assigned chapter before coming to each class. Something hidden in the textbook will not appear in the exam without being mentioned during the class.

**Cowen's History of Life. 6<sup>th</sup> ed.** by Michael J. Benton, Wiley-Blackwell.



### Lecture Slides

Each lecture starts with a list of questions that are answered during the lecture and in-class activities. These "lecture questions" occupy a high percentage of exam questions. The answers are not always simple, so it is essential to come to each class and write up your understanding of the answers. PDF files containing the lecture slides will be posted on D2L usually a day before the class is scheduled, but **they are not a substitute for coming to class or for taking your own notes.** My lecture slides are mostly images and key words to complement explanations that I will provide during the lectures. You can either print them off or download them on your laptop to annotate them with details from the lectures along the margins and study them for exams. If you miss classes or do not take your own notes, the lecture slides alone would not be helpful for you to understand what was covered in class. When you miss a class, come and see me during my office hours to ask questions about the missed class. **I do not have any written lecture notes.**

### Expectation Agreement

**As a student in GEOS 170C1, you're expected to ...**

- Bring yourself to every class and arrive to class on time prepared with reading, clicker, paper and pencil.
- Check D2L and email daily.
- Stay focused and ready to participate in class.
- Turn in assignments on time.
- Silence your cell phones and put them away before class begins.
- Use your laptop or tablet in class **ONLY** for taking notes or accessing relevant course material on D2L.

**As your instructor, I will ...**

- Come to class prepared and offer classes worth attending
- Be available for my office hours and by appointment
- Keep course website on D2L engaging and up-to-date.
- Assist you with finding additional support should you need it.
- Respond to your emails within one business day.

## Pre-class D2L Reading quizzes

It is well-established that pre-reading about upcoming topics improves students' performance in class and on exams. When you read ahead of time, you are more likely to understand the lecture and figure out what is important and what is not. Therefore, I strongly encourage you to read the assigned textbook chapter or posted reading on D2L and take the pre-class D2L quiz before coming to each class (**due by 11:30 AM on D2L**). The pre-class quizzes are designed to incentivize and guide the readings.

## Clicker Quizzes

We will use clickers everyday to make the lectures more engaging and also to promote active learning environments. There will be several multiple choice clicker questions in every lecture. These questions can range from simple recall questions, conceptual understanding, and critical thinking questions. Students can use clicker questions as both formative and summative assessment to monitor their own learning. And I can use them to respond student learning needs. In order to earn **full credit**, you need to **answer at least 60% of the questions correctly**.

## In-class Activities

We will do in-class activities in groups of up to four students every day. Most activities will include problem solving questions based on data – charts and graphs. Others will be based on reading a short article and/or watching a video clip followed by answering and discussing a few questions in groups. A few activities will be based on hands-on experiments. Please bring writing tool – pencil or pen to every class. There will be exam questions from activities. So keep them organized.

## Grading Overview

Item	Percentage
Pre-class D2L Reading Quizzes	15% (drop 5 lowest items)
Clicker Quizzes	5% (drop 5 lowest items)
In-class Activities	5% (drop 5 lowest items)
Exams	75% (drop one lowest exam)
Total possible	100%

**Grade Distribution:** To earn an A in the class you must earn at least 90%. **No exceptions.** Your final grade for the course is based on the following total scores:

≥ 90% = A      89.99 - 80% = B      79.99 - 70% = C      69.99 - 60% = D      below 60% = E

## Class Policies & Conduct

You have chosen to participate in this class. I want you to be clear on why you are here and what you hope to get out of class. Please refrain from disruptive conversation with people sitting around you during lecture. **Students observed engaging in disruptive activity will be asked to leave the classroom** and will be reported to the Dean of Students. I will drop several grade items at the end of the semester – **you can miss up to five D2L quizzes, five clicker quizzes, five in-class activities, and one exam due to emergency or illness and not lose any points.**

## Exams

Four exams will be given this semester (see schedule on page four). Three are midterms and one is a cumulative final exam. Your three highest exam score will count and we **drop one lowest scored exam**. Your final exam can be your dropped exam. There are **no make-ups (no exceptions!)** on exams as we drop one exam grade. Please plan ahead for all exams and plan your travel accordingly. Exams will be given in multiple-choice, true/false, match-up and short-answer format and draw heavily from lectures, in-class assignments, and quizzes.

## Honors Requirement

All registered honors students in the course will complete **Tree of Life project by 5 PM on Thursday, 4/16**. This project will help students understand evolutionary relationships among major groups of organisms. Check D2L for a detailed description of the project. I want to work closely with all honors students - come to my office hours or make an appointment to meet with me while working on this project. If you want feedback and suggestions on your project, turn in your draft two weeks prior to the project due date (Thursday, 4/2 – optional).

## Tentative Course Schedule

Date	Lecture Topic	Reading	D2L Quiz (due by 11:30 AM)
Th 1/16	Introduction	Syllabus	#1 due (mandatory)
T 1/21	The Dynamic and Evolving Earth	Ch. 1	#2 due
Th 1/23	The Origin of Life on Earth	Ch. 1	#3 due
T 1/28	Evolution	D2L	#4 Due
Th 1/30	Rocks, Fossils and Time	Ch. 2	#5 Due
T 2/4	The Earliest Life on Earth	Ch. 2	#6 Due
Th 2/6	Classification and Cladistics	Ch. 3	#7 Due
T 2/11	The Origin of Eukaryotes	Ch. 3	#8 Due
Th 2/13	The Evolution of Metazoans	Ch. 4	#9 Due
<b>T 2/18</b>	<b>Exam 1</b>	-----	-----
Th 2/20	The Cambrian Explosion	Ch. 5	#10 Due
T 2/25	Changing Life through Time	Ch. 6	#11 Due
Th 2/27	The Early Vertebrates	Ch. 7	#12 Due
T 3/3	Leaving the Water	Ch. 8	#13 Due
Th 3/5	Vertebrates Conquer the Land	Ch. 9	#14 Due
<b>T 3/10</b>	<b>Spring recess (no class)</b>	-----	-----
<b>Th 3/12</b>	<b>Spring recess (no class)</b>	-----	-----
T 3/17	The Amniote Radiation	Ch. 10	#15 Due
Th 3/19	The Triassic Takeover	Ch. 12	#16 Due
T 3/24	Dinosaurs	Ch. 13	#17 Due
<b>Th 3/26</b>	<b>Exam 2</b>	-----	-----
T 3/31	Evolution of Flight	Ch. 14	#18 Due
<b>Th 4/2</b>	The Origin and Evolution of Birds <b>Tree of Life Draft Due</b> (optional – honors only)	Ch. 14	#19 Due
T 4/7	The Mesozoic Marine Revolution	Ch. 11	#20 Due
Th 4/9	The Cretaceous Terrestrial Revolution	Ch. 15	#21 Due
T 4/14	The Origin of Mammals	Ch. 18	#21 Due
<b>Th 4/16</b>	The Evolution of Mammals <b>Tree of Life Project Due (honors only)</b>	Ch. 19	#22 Due
T 4/21	Primates	Ch. 21	#23 Due
Th 4/23	Evolving Toward Humans	Ch. 22	#24 Due
T 4/28	Life in the Ice Age	Ch. 23	#25 Due
Th 4/30	Conclusion and Review	-----	-----
<b>T 5/5</b>	<b>Exam 3</b>	-----	-----
<b>W 5/13</b>	<b>Final Exam (1:00 – 3:00 PM )</b>	-----	-----

**Subject to Change Statement:** Information contained in the course syllabus, other than the grade and absence policy, may be subject to change with advance notice, as deemed appropriate by the instructor.

**Final Examination:** The date and time of the final exam along with Final Exam Regulations can be found at: <http://www.registrar.arizona.edu/schedules/finals.htm>

## Absence & Class Participation Policy

Participating in the course and attending lectures and other course events are vital to the learning process. As such, attendance in all lectures is strongly suggested and greatly benefit your learning. However, **if you do not plan on participating fully, please do not come** – you will be a distraction to those who are in class to learn. Please arrive on time and stay for the full class period.

The UA's policy concerning Class Attendance, Participation, and Administrative Drops is available at:

### Accessibility & Accommodations

Our goal in this classroom is that learning experiences be as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, please let me know immediately so that we can discuss options. You are also welcome to contact the Disability Resource Center (520-621-3268) to establish reasonable accommodations. For additional information on the Disability Resource Center and reasonable accommodations, please visit <https://drc.arizona.edu/>.

If you have reasonable accommodations, please plan to meet with me by appointment or during office hours to discuss accommodations and how my course requirements and activities may impact your ability to fully participate.

Please be aware that the accessible table and chairs in this room should remain available for students who find that standard classroom seating is not usable.

### Threatening Behavior Policy

The UA Threatening Behavior by Students Policy prohibits threats of physical harm to any member of the University community, including to oneself. See <http://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students>.

<http://catalog.arizona.edu/policy/class-attendance-participation-and-administrative-drop>

The UA policy regarding absences for any sincerely held religious belief, observance or practice will be accommodated where reasonable, <http://policy.arizona.edu/human-resources/religious-accommodation-policy>.

Absences pre-approved by the UA Dean of Students (or Dean Designee) will be honored. See: <https://deanofstudents.arizona.edu/absences>

### Classroom Behavior Policy

To foster a positive learning environment, students and instructors have a shared responsibility. We want a safe, welcoming, and inclusive environment where all of us feel comfortable with each other and where we can challenge ourselves to succeed. To that end, our focus is on the tasks at hand and not on extraneous activities (e.g., texting, chatting, reading a newspaper, making phone calls, web surfing, etc.).

### Code of Academic Integrity

Students are encouraged to share intellectual views and discuss freely the principles and applications of course materials. However, graded work/exercises must be the product of independent effort unless otherwise instructed. Students are expected to adhere to the UA Code of Academic Integrity as described in the UA General Catalog. See: <http://deanofstudents.arizona.edu/academic-integrity/students/academic-integrity>.

### UA Nondiscrimination and Anti-Harassment Policy

The University is committed to creating and maintaining an environment free of discrimination; see <http://policy.arizona.edu/human-resources/nondiscrimination-and-anti-harassment-policy>

## Help & Resources

If you are feeling lost or overwhelmed ...

1. Come and see me  
You are welcome to drop by during my office hours when you need help. You can also email me, or make an appointment to meet during my office hours or other times that work for both of us. Many questions and issues can be easily resolved this way.

2. Visit the Think Tank  
Think Tank on UA campus offers free drop-in tutoring, review sessions, or private scheduled tutoring for a fee. They are located in Bear Down Gymnasium;

Email: [sls-thinktank@email.arizona.edu](mailto:sls-thinktank@email.arizona.edu),  
Phone: (520) 626-0530

See the website for details:  
<http://thinktank.arizona.edu/>

## Copyright

Students are prohibited from selling course materials including lecture slides, assignments, quizzes, additional materials posted on D2L course website, and being paid to take lecture notes without the express written permission of the instructor. Violations of this prohibition will be treated as violations of the University Academic Integrity and will result in course sanctions. Additionally, students who use D2L or UA email to sell or buy these copyrighted materials are subject to Code of Conduct violations for misuse of student email addresses. This conduct may also constitute copyright infringement.