

# GEOL 441/541: GREAT EVENTS IN EARTH HISTORY

## Spring 2023 Syllabus

**Professor:** Dr. Geoff Gilleaudeau

**Meeting Time:** Mondays 10:30 to 1:10 pm

**Meeting Place:** Exploratory Hall Room 1005

**Professor's Office:** Exploratory Hall Room 3452

**Office Hours:** Any available time by appointment (just email me)

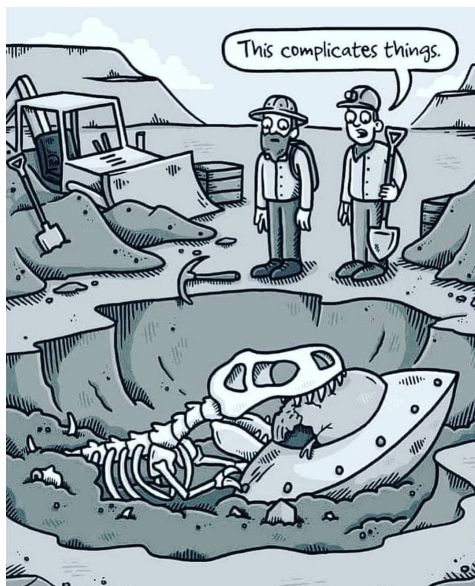
**Professor's Email:** ggilleau@gmu.edu

### Course Goals:

The story of Earth is one of the most gripping and compelling tales ever told. Through 4.5 billion tumultuous years, Earth has undergone monumental changes from the formation of the moon, early magma oceans and meteorite bombardment, the origin of life, the buildup of oxygen, great ice ages, the explosion of multicellular organisms, great mass extinction events, and ultimately, human evolution and anthropogenic change. In this course, each week we will have an in-depth, student-led discussion on one “Great Event” that helped shape the course of Earth history. In addition to providing perspective on the fascinating history of our planet, this course is also designed to teach scientific literacy. That means being able to read and interpret the primary scientific literature, generate informed lines of discussion, present ideas clearly, and ultimately, write a scientific paper and make a conference-style scientific presentation on the “Great Event” of your choice. This course is meant to be fun, intellectually-stimulating, and highly participatory!

*“Thus, although we are mere sojourners on the surface of the planet, chained to a mere point in space, enduring but for a moment of time, the human mind is not only enabled to number worlds beyond the unassisted ken of mortal eye, but to trace the events of indefinite ages before the creation of our race, and is not even withheld from penetrating into the dark secrets of the ocean, or the solid globe.”*

— Charles Lyell



## **Grading Scheme:**

Each week for each “Great Event”, 3 to 4 scientific papers will be assigned for discussion. Each student is expected to thoroughly read and be prepared to discuss each paper that is assigned. There will be a total of 11 discussion weeks (11 “Great Events”). Geoff will lead the discussion for the first “Great Event”. For the following 10 weeks, the discussion will be led by students in groups of 2 or 3.

Your final course grade will consist of:

### **30%: Leading of discussions**

Each student will end up leading the discussion 3 times throughout the course of the semester. The discussion-leading groups are encouraged to be creative in the use of class time. Some ideas for taking the lead include (but are not limited to):

- Beginning the class period with a short PowerPoint providing the necessary background for the ensuing discussion
- Preparing a list of discussion questions for each paper
- Designing a classroom activity that illustrates key concepts/linkages
- Being prepared to define terms that are unfamiliar to the class
- Promoting participation and a stress-free idea-sharing environment

Geoff will lead the discussion on the first week to provide some examples and ideas. Geoff will also be prepared to jump in if the discussion stalls. After the discussion, the group that leads will hand in whatever materials they used (i.e., their PowerPoint or list of discussion questions). A grading rubric for the discussion leads will be provided in a separate document.

### **30%: Weekly write-ups**

For the 8 weeks that you are NOT leading the discussion, each student is required to turn in a short write-up summarizing the broad concepts covered in the papers and in the class discussion. It should be 1 to 2 pages (single-spaced), written in scientific style, and make reference to each paper assigned. A guide for writing these will be provided in a separate document.

These will be due via Blackboard by 10am on the Friday morning following the Monday discussion. I will try to grade them by the following Monday. 10% will be taken off for each day late.

### **30%: Term paper on the “Great Event” of your choice**

Each student will choose one “Great Event” on which to write an ~10-15-page (single-spaced including figures and references) term paper. In this paper, students will be required to investigate the scientific literature beyond what has been assigned in class. A first draft will be turned in on Week 10 (see schedule below). Your draft will then be reviewed by both Geoff and one of your peers in the class. We have set aside Week 11 to discuss papers and revisions. Your peer review of a classmate’s paper will then be due on Week 12. You will then have an

opportunity to consider the comments and make revisions before turning in your final version by 5/5/23 (see schedule below). This 30% of your grade will be divided as follows:

- 5%: your first draft
- 10%: your peer review of a classmate's paper
- 15%: your final paper

Rubrics and suggestions for your paper and peer review will be provided in a separate document.

**10%: Final presentation (only for graduate students enrolled in GEOL 541)**

On the final week of class, each graduate student will give a conference-style 15-minute presentation on the "Great Event" that they chose for their paper. Rubrics and suggestions will be provided in a separate document. In lieu of a presentation, undergraduate students in GEOL 441 will have their discussion leads and weekly write-ups each count for 35% of their final grade.

**Final Grading Scale:**

97 to 100% = A+	73 to 77% = C
93 to 97% = A	70 to 73% = C-
90 to 93% = A-	67 to 70% = D+
87 to 90% = B+	63 to 67% = D
83 to 87% = B	60 to 63% = D-
80 to 83% = B-	Less than 60% = F
77 to 80% = C+	

**Fun popular science readings that may help (not required):**

*The Story of Earth: The First 4.5 Billion Years, From Stardust to Living Planet*  
Book by Robert M. Hazen

*Life on a Young Planet: The First Three Billion Years of Evolution on Earth*  
Book by Andrew H. Knoll

## **Semester Schedule:**

Week 1 (1/23/23): Introductions, syllabus, and initial discussion

Week 2 (1/30/23): **Formation of the moon and the Giant Impact Hypothesis** (discussion led by Geoff)

Week 3 (2/6/23): **Origin of life and the oldest evidence of life on Earth** (discussion led by students A and B)

Week 4 (2/13/23): **The Great Oxidation Event: Causes and consequences** (discussion led by students C, D, and H)

Week 5 (2/20/23): **Neoproterozoic Snowball Earth and environmental change** (discussion led by students E and F)

\*\*\*A paragraph describing your term paper topic will be due via Blackboard by Week 5

Week 6 (2/27/23): **The Ediacara biota: Evolution, ecology, and extinction** (discussion led by students A, G, and H)

Week 7 (3/6/23): **The Great Ordovician Biodiversification Event** (discussion led by students B and C)

Week 8 (3/13/23): Spring Break (No Class)

Week 9 (3/20/23): **The Devonian/Carboniferous Part I** (discussion led by students D and E)

Week 10 (3/27/23): **The Devonian/Carboniferous Part II** (discussion led by students F and G)

\*\*\*First draft of term paper due by class time on Week 10. Each paper will be distributed to a classmate for peer review. 10% will be taken off for each day late.

Week 11 (4/3/23): No "Great Event" for this week; short meeting to discuss term paper and peer review

Week 12 (4/10/23): **Mesozoic global events: Climate, ecology, and the age of dinosaurs** (discussion led by students A and D)

\*\*\*Peer review of your classmate's paper is due by class time on Week 12.

Week 13 (4/17/23): **The Paleocene-Eocene Thermal Maximum** (discussion led by students B, F, and H)

Week 14 (4/24/23): **Extinction of the Pleistocene megafauna** (discussion led by students C, E, and G)

Week 15 (5/1/23): Final presentations; wrap-up discussion

\*\*\*Final term paper due via Blackboard on 5/5/23.

**Student A:** Abel Aragon  
**Student B:** Marcia Brisson  
**Student C:** Mason Brown  
**Student D:** Edward Medeiros  
**Student E:** Cathy Dunn  
**Student F:** Willow Hasley-Velez  
**Student G:** Nick Kahane  
**Student H:** Zach Sauter

### **Academic Integrity**

*The integrity of the University community is affected by the individual choices made by each of us. Mason has an Honor Code with clear guidelines regarding academic integrity. Three fundamental and rather simple principles to follow at all times are that: (1) all work submitted be your own; (2) when using the work or ideas of others, including fellow students, give full credit through accurate citations; and (3) if you are uncertain about the ground rules on a particular assignment, ask for clarification. No grade is important enough to justify academic misconduct. Plagiarism means using the exact words, opinions, or factual information from another person without giving the person credit. If you have any doubts about what constitutes plagiarism, please see me.*

### **Disability Accommodations**

*Disability Services at George Mason University is committed to providing equitable access to learning opportunities for all students by upholding the laws that ensure equal treatment of people with disabilities. If you are seeking accommodations for this class, please first visit <http://ds.gmu.edu/> for detailed information about the Disability Services registration process. Then please discuss your approved accommodations with me. Disability Services is located in Student Union Building I (SUB I), Suite 2500. Email: [ods@gmu.edu](mailto:ods@gmu.edu) | Phone: (703) 993-2474*

### **Privacy**

*Students must use their Mason email account to receive important University information, including communications related to this class. I will not respond to messages sent from or send messages to a non-Mason email address.*