130 x 20

Earth History and Stratigraphy

Department of Geology | Spring 2026

Course Information

Course:	Earth History and Stratigraphy
Room:	Building Name 123
Day/Times:	T, R 2:00 P.M.- 3:15 P.M.
Prerequisites:	The previous assigned classes
Textbook:	No textbook. Various assigned readings

Instructor Information

Name:	Dr. Bolton Howes
Office:	Insert Email
Email:	bolton.howes@wheaton.edu
Office Hours:	8:00 A.M.- 9:00 P.M.

Course description

Layered sedimentary rocks preserve a vast majority of Earth's history. This course will cover how these layers of sediments form, the techniques geologists use to study them, and of course the history preserved within them. We will learn about how rocks are eroded =, transported, and deposited—how basins form in order to hold them and how the textures, compositions, and structures within the rocks bely the environments in which they form.

Our exploration of Earth's history will be a quantitative journey—meaning there will be math and coding involved. If you do not have much experience with applying math and coding to sceintific problems, it will be hard. But that is a good thing, we are here to do hard things. hi

And His Kingdom

We study geology and specifically Earth history not just because it is really cool, but because we believe that the understanding Earth 1. Helps us appreciate God's creation and 2. Encourages good stewardship of the Earth 3. Has the opportunity to protect and help people.
TShese readings will be exmamples of how geoscientists have used the study of Earth's history for His Kingdom.
"...every act of love, every deed done in Christ and by the Spirit, every work of true creativity — doing justice, making peace, healing families, resisting temptation, seeking and winning true freedom — is an earthly event in a long history of things that implement Jesus' own resurrection and anticipate the final new creation and act as signposts of hope, pointing back to the first and on to the second"

Learning Outcomes

By the end of this course, participants will be able to: [UPDATE WHEN SYLLABUS IS FINISHED]

1. How did geologists determine the age of the Earth?
2. What are the controls and feedbacks on the carbon cycle?
3. The Winter of our Dis-C-content - the carbon cycle
4. How does the sedimentary record form?
   (a) Erosion [Dunes?]
   (b) Transport [Turbidites]
   (c) Deposition [Turbidites pt 2]

   (d) Preservation [Sadler/Peters/Database]
5. Beware the Tides of March...
6. Develop a deep understanding of a handful of events in Earth's history.
7. Develop quantitative skills for interrogating the stratigraphic record and events in Earth's history.
8. Communicate geological findings effectively in both written and oral formats.

Essential Equipment

1. Computer
2. Mouse (recommended)
3. Install Python or be ready to use Google Colab
4. Illustrator
5. Latex (or use Overleaf) / Microsoft Word
6. QGIS or know of a computer with ArCGIS installed

Course Evaluation and Grading Policies

Grades are based on: Attendance/Participation (10%), exams (2 @ 10%), homework (20%), projects (40%), and final exam (10%).
The grade of "I" (incomplete) can be given ONLY when a student, who is doing otherwise acceptable work (passing grade) and cannot complete a part of work (e.g., the final exam) because of documented illness or other conditions beyond the student's control. In the latter case, the student must discuss the situation with the instructor and complete an application form from the department before the part of the work is due or as soon as the circumstances are known.

Topic	**Readings**	**Assignments**
T: Introduction and motivation	—	Presentation Groups
R: How do we not know the age of the Earth?	Chapter geochron	Install Python/On ramp
Lab: Claire Patterson's Canyon Diablo	Podcast & Article	Finish Lab
T: The Carbon Cycle	Hmmm	Mass Balance
R: Snowball Earth	Hoffman Readings	
Lab: Box Model Pt. I	...	Winter of our Dis-^{13}C-ontent
T: Erosion	...	...
R: The Great Unconformity	Groups (Keller, MacDonald, Peters)	...
Lab: Box Model Pt. II	...	Winter of our Dis-^{13}C-ontent
T: Deposition	...	...
R: The Great Unconformity	Groups (Keller, MacDonald, Peters)	...
Lab: Box Model Pt. II	...	Winter of our Dis-^{13}C-ontent
T: Preservation	...	...
R: The Great Unconformity	Groups (Keller, MacDonald, Peters)	...
Lab: Saddler	...	