

## Term Information

Effective Term Autumn 2020  
[Previous Value](#) Summer 2012

## Course Change Information

### What change is being proposed? (If more than one, what changes are being proposed?)

To renumber the course from 1122H to 2122H

AND

To change the title to "Climate and Life over Billions of years on Earth"

### What is the rationale for the proposed change(s)?

To align the course number with the course expectations, which have been above a 1000-level for the last several years

To name the course appropriately so that students appropriately anticipate the topics addressed in the course

### What are the programmatic implications of the proposed change(s)?

(e.g. program requirements to be added or removed, changes to be made in available resources, effect on other programs that use the course)?

The renumbering will lead to changing the course from a "preparation" course to a "major" course, while still meeting the goals and objectives of a physical science GE. Realignment as a major course is consistent with studies of national trends of the level assigned to this course for geoscience majors.

Is approval of the request contingent upon the approval of other course or curricular program request? Yes

Please identify the pending request and explain its relationship to the proposed changes(s) for this course (e.g. cross listed courses, new or revised program)

The Earth Science BS revision requires this change happen as only >2000 numbered courses can count as part of the major.

Is this a request to withdraw the course? No

## General Information

Course Bulletin Listing/Subject Area	Earth Sciences
Fiscal Unit/Academic Org	School of Earth Sciences - D0656
College/Academic Group	Arts and Sciences
Level/Career	Undergraduate
Course Number/Catalog	2122H
<a href="#">Previous Value</a>	1122H
Course Title	Honors Climate and Life over Billions of years on Earth
<a href="#">Previous Value</a>	Honors Earth Through Time
Transcript Abbreviation	Hnrs Ea Clim Life
<a href="#">Previous Value</a>	Hnrs EarthThruTime
Course Description	Origin and evolution of Earth, including its physical, chemical, and biological components; principles of geologic inference and their application to interpreting Earth.
Semester Credit Hours/Units	Fixed: 4

## Offering Information

Length Of Course	14 Week, 12 Week, 8 Week, 7 Week, 6 Week
Flexibly Scheduled Course	Sometimes
Does any section of this course have a distance education component?	No

**COURSE CHANGE REQUEST**  
2122H - Status: PENDING

Last Updated: Haddad, Deborah Moore  
09/01/2019

---

Grading Basis	Letter Grade
Repeatable	No
Course Components	Laboratory, Lecture
Grade Roster Component	Lecture
Credit Available by Exam	No
Admission Condition Course	Yes
Admission Condition	Natural Science
Off Campus	Never
Campus of Offering	Columbus, Lima, Mansfield, Marion, Newark

## Prerequisites and Exclusions

Prerequisites/Corequisites	Prereq: Honors standing, or permission of instructor.
Exclusions	Not open to students with credit for EarthSci 1122 or 1122H.
<i>Previous Value</i>	Not open to students with credit for EarthSci 122, 122H, GeolSci 122, or 122H.
Electronically Enforced	Yes
<i>Previous Value</i>	<b>No</b>

## Cross-Listings

Cross-Listings

## Subject/CIP Code

Subject/CIP Code	40.0601
Subsidy Level	General Studies Course
Intended Rank	Freshman, Sophomore, Junior, Senior

## Requirement/Elective Designation

Required for this unit's degrees, majors, and/or minors

General Education course:

Physical Science

*Previous Value*

*General Education course:*

*Physical Science*

## Course Details

**Course goals or learning objectives/outcomes**

- Learn how to identify and classify common rocks  
Explain how plate tectonics relate to other geologic processes
- Learn how to use proxies to interpret ancient environments  
Develop hypotheses and evaluate those hypotheses based on collected data
- Gain skills in scientific research  
Learn the theory of evolution and evidence of evolution in the fossil record Understand how changes in the environment impact the history of life
- Understand controls on global climate change  
Gain critical thinking skills and practice applying knowledge to new situations  
Gain experience and proficiency using computational tools to organize and analyze data

**Previous Value**

**Content Topic List**

- Origin of Earth
- Origin of life
- Plate tectonics and climate
- Sedimentary rocks
- Greenhouse and icehouse cycles
- Mass extinctions
- Snowball Earth
- Paleozoic Earth history
- Mesozoic Earth history
- Cenozoic Earth history

**Sought Concurrence**

No

**Attachments**

- 2122H\_syllabus.doc: syllabus  
*(Syllabus. Owner: Panero, Wendy R)*
- EarthSci2122H\_GEC\_Learning\_Assessment\_Report.docx: assessment plan  
*(GEC Course Assessment Plan. Owner: Panero, Wendy R)*

**Comments**

- Sorry I missed that one, Bernadette! Fixed now. *(by Panero, Wendy R on 09/01/2019 09:45 AM)*
- Please renumber on the form itself. This is not a field that I can change for you. *(by Vankeerbergen, Bernadette Chantal on 08/30/2019 04:26 PM)*

**COURSE CHANGE REQUEST**  
2122H - Status: PENDING

Last Updated: Haddad,Deborah Moore  
09/01/2019

**Workflow Information**

Status	User(s)	Date/Time	Step
Submitted	Panero,Wendy R	08/30/2019 01:34 PM	Submitted for Approval
Approved	Panero,Wendy R	08/30/2019 01:35 PM	Unit Approval
Approved	Haddad,Deborah Moore	08/30/2019 02:27 PM	College Approval
Revision Requested	Vankeerbergen,Bernadette Chantal	08/30/2019 04:26 PM	ASCCAO Approval
Submitted	Panero,Wendy R	09/01/2019 09:45 AM	Submitted for Approval
Approved	Panero,Wendy R	09/01/2019 09:45 AM	Unit Approval
Approved	Haddad,Deborah Moore	09/01/2019 12:51 PM	College Approval
Pending Approval	Vankeerbergen,Bernadette Chantal Oldroyd,Shelby Quinn Hanlin,Deborah Kay Jenkins,Mary Ellen Bigler	09/01/2019 12:51 PM	ASCCAO Approval

Lecture: MWF 12:40-1:35, ML 163

Lab: Tu 12:45-2:35, ML 163

General Information:

*Instructor:* Dr. Matthew R. Saltzman

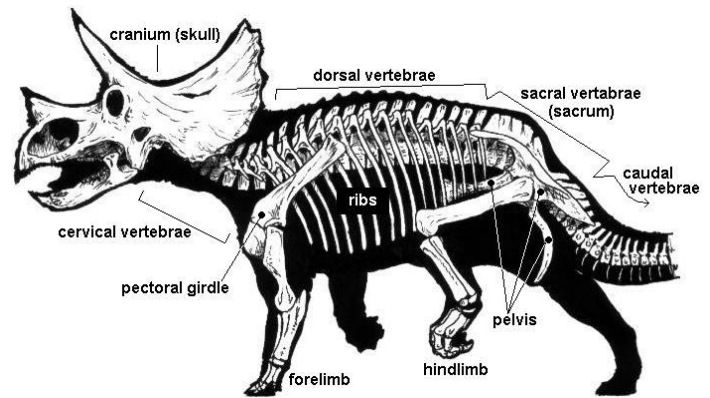
*Office:* Room 86 Orton Hall

*email:* saltzman.11@osu.edu; phone: 292-0481

*Office Hrs:* T: 2:35-3:35 & W 1:35-2:35 or by appt

**Earth Sciences 2122H Course Description:** We will

examine the basic principles and methods of the modern historical earth sciences, including sedimentary rocks and their importance as records of earth history, relative age determination, absolute age determination, fossils and fossilization, stratigraphy, evolution, and controls on global climate change. We will also examine the basic facts and theories of modern historical earth sciences, including origin of the earth and solar system, and history of the earth and life on earth during the Precambrian, Paleozoic, Mesozoic, and Cenozoic periods.



**Goals and Learning Objectives**

Earth Science 2122H is a physical science course in the natural science category of the GE, which has the following goals and learning outcomes:

1. Students understand the basic facts, principles, theories, and methods of modern science.
2. Students understand key events in the development of science and recognize that science is an evolving body of knowledge.
3. Students recognize the inter-dependence of scientific and technological developments.
4. Students recognize social and philosophical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world.

ES 2122H is designed to meet these requirements by introducing you to the fundamentals of geology, the scientific method, and critical thinking about the complexities of the natural world. More specifically, in this class you will

- Learn how to identify and classify common rocks
- Explain how plate tectonics relate to other geologic processes
- Learn how to use proxies to interpret ancient environments
- Develop hypotheses and evaluate those hypotheses based on collected data
- Gain skills in scientific research
- Learn the theory of evolution and evidence of evolution in the fossil record
- Understand how changes in the environment impact the history of life
- Understand controls on global climate change
- Gain critical thinking skills and practice applying knowledge to new situations

- Gain experience and proficiency using Microsoft Excel to organize and analyze data

Textbook: *Earth System History*, Stanley (recommended); *Earth's Climate: Past and Future*, Ruddiman, (selected readings posted as 'e-reserve' on CARMEN). Texts are available on reserve in Orton Library.

Laboratory: **Weekly Lab Exercises will be uploaded to Carmen.** *You will need to print out each exercise and bring to each lab.* You will not be required to purchase any additional lab manual. You will be responsible for the printing costs of the labs uploaded here. **\*\*There will be a penalty if you fail to print out the lab before you arrive at your laboratory session.\*\***

Class Meetings and Laboratory: You are encouraged to attend all lectures. Those who miss lectures are at a significant disadvantage in exams. *Please turn off cellphones. Computers may only be used to take class notes.* Students must attend one laboratory session per week. Lab exercises supplement, reinforce lecture material. There are no makeup labs. You must attend the lab session for which you are registered.

TopHat: We will use a classroom response system that allows you to participate and answer questions in class, TopHat. Points are awarded for questions answered correctly in class – in other words, we have daily 'quizzes'. Clicker points will count as *5% of each exam score* (and so can affect score by about a half grade, e.g. from C to C+ or B+ to A-). There will also be bonus points for participation in class using your clicker (some clicker questions are opinion or thought questions).

Exams: There are 3 exams (**no makeups**). Each exam will cover only material since the previous midterm exam. Exams may consist of multiple-choice, true-false questions, short answers or short essays. The best way to do well on the exam is to attend lectures and labs and take your own notes. ***If it's on the exam, it was in the lectures.***

Grading: 3 exams = 75% (25% each); Lab score = 25%. Grades assigned using OSU Standard Scheme on Carmen.

**Academic Misconduct:** *Any material submitted in Earth Science 2122H must represent your own work. Violations of this standard will be referred to the University Committee of Academic Misconduct (COAM) as required by Faculty Rules.*

Any student suspected of engaging in academic misconduct as set forth in section 3335-23-02 of the Code of Student Conduct will be reported to the Committee on Academic Misconduct. Academic misconduct is defined in the code as "any activity that tends to compromise the academic integrity of the University, or subvert the educational process." Examples include but are not limited to violation of course rules, submitting plagiarized work, knowingly providing or receiving information during exams or quizzes, and other such acts of academic dishonesty. For additional information, see the Code of Student Conduct at <http://studentconduct.osu.edu>.

**Statement on University Expectations regarding 2:1 ratio of student effort:** In an effort to establish educational standards and expectations for all institutions of higher education in the state, the Ohio Board of Regents has established formal guidelines to standardize the length of semesters, academic years, and define the practical meaning of each semester hour of credit. As part of these guidelines, the Board of Regents' guidelines state that one semester credit hour will be awarded for a minimum of 750

minutes of formalized instruction, and that **“students will be expected to work at out-of-class assignments on a regular basis, which, over the length of the course, would normally average two hours of out-of-class study for each hour of formal class activity.”** Out class meets for approximately 4.5 hours per week, therefore, you should expect to spend **9 hours/week on out of class work.**

**Student Accommodations:** The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on a disability (including mental health, chronic or temporary medical conditions), you should register with the Office for Disability Services (ODS). After you receive your authorized accommodation from ODS, you should show me your access plan and discuss your needs with me. **Ideally, we should meet within the first two weeks of class.**

**Statement on Diversity:** The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach his or her own potential.

**Statement on Sexual Misconduct/Relationship Violence:** Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at <http://titleix.osu.edu> or by contacting the Ohio State Title IX Coordinator, Kellie Brennan, at [titleix@osu.edu](mailto:titleix@osu.edu).

**Statement on Counseling Services:** Should you find yourself experiencing personal difficulties, whether related to class or not, please know that you have access to confidential services provided by the OSU Counseling and Consultation Services (CCS).

**Statement regarding Tobacco Free Campus policy:** Ohio State has adopted a tobacco free policy that supports a healthy environment for all members of the campus community. The use of all types of tobacco products is prohibited in all university buildings and on all university-owned properties, including parking lots and all outside areas. The full policy can be found at <http://hr.osu.edu/public/documents/policy/resources/720faq.pdf?t=2014724155314>.

Course Calendar-Earth Sciences 1122H		Dr. Matthew Saltzman		
Week	Dates	Lecture Topic ( <i>TENTATIVE!</i> )	Readings: Stanley ST; Ruddiman RU (e-reserve)	Lab Topic/Exercise #
1	12-Jan	Introduction: The Earth System	ST Ch 1	<i>NO LAB MEETING</i>
	14-Jan	Intro Earth System and Geologic Time		
	16-Jan	Geologic Time and The Universe	ST Ch 11; RU Ch 3	
2	19-Jan	<i>NO CLASS - MLK DAY</i>		Plate Boundaries: Discovering Plate Tectonics
	21-Jan	The Universe	ST Ch 11; RU Ch 3	
	23-Jan	Solar System		
3	26-Jan	Venus and Mars		Rock Identification I: Minerals
	28-Jan	Solar System-Life		
	30-Jan	Plate tectonics and climate	RU Ch 4-5; ST Ch 2,8,9,10	
4	2-Feb	Earth's Thermostat		Rock Identification I: Igneous & Metamorphic
	4-Feb	Earth's Thermostat	RU Ch 4-5; ST Ch 2,8,9,10	
	6-Feb	The Carbon cycle		
5	9-Feb	Pangea and climate I		Rock Identification II: Sedimentary
	11-Feb	Pangea and climate II		
	13-Feb	<b>EXAMINATION I</b>		
6	16-Feb	Sedimentary Rocks	ST Ch 2,5	Fossil Identification
	18-Feb	Sedimentary Rocks		
	20-Feb	Fossils	ST Ch 3	
7	23-Feb	Fossils		Environments of Fossilization
	25-Feb	Geologic time	ST Ch 6	
	27-Feb	Geologic time		
8	2-Mar	Glacial Environments	ST Ch 5	Sedimentary features
	4-Mar	Glacial Environments		
	6-Mar	Ice ages		
9	9-Mar	Ice ages		Reconstructing ancient environments
	11-Mar	Ice ages		
	13-Mar	<b>EXAMINATION II</b>		
10	16-Mar	<i>NO CLASS - Spring Break</i>		<i>NO Lab</i>
	18-Mar	<i>NO CLASS - Spring Break</i>		
	20-Mar	<i>NO CLASS - Spring Break</i>		
11	23-Mar	Evolution	ST Ch 7	Geologic Controversies I (film)
	25-Mar	Molecular Evolution		
	27-Mar	The Great Oxidation Event	ST Ch 12, 13, 14, 15	
12	30-Mar	Snowball Earth and Cambrian Explosion	cladistics/molec clock; ST Ch 12, 13, 14, 15	Dinosaur Cladistics
	1-Apr	Paleozoic Earth history and Ohio geology	molec clock/camb explosion/GOBE	
	3-Apr	Permo-Triassic extinction	Paleoz-fauna/End-Ord extinct	
13	6-Apr	Permo-Triassic extinction	PTB-I	Geologic Time
	8-Apr	Permo-Triassic extinction	PTB-II(MOVIE)	
	10-Apr	Dinosaurs: Warm or Cold-blooded?	PTB-III ST Ch 16, 17, 18	
14	13-Apr	Dinosaurs and extinction	Dinos-Warm/Cold	Geologic Controversies II (film)
	15-Apr	End-Cretaceous extinction	KTB ST Ch 16, 17, 18	
	17-Apr	End-Cretaceous extinction	KTB-II	
15	20-Apr	Humans: Evolution	KTB-III ST Ch 19, 20	Climate Cycles
	22-Apr	Humans: Evolution	Humans	
	24-Apr	Global Change	GICha	
16	27-Apr	<b>EXAMINATION III</b>		<i>NO LAB (classes end on Mon Apr 27)</i>



**GEC COURSE ASSESSMENT PLAN AND REPORT FOR  
EARTHSCI 2122H: Climate and Life over Billions of  
years on Earth**

August, 2019

PREPARED BY THE SES CURRICULUM COMMITTEE

## I. Summary

This document details the assessment plan and report for EarthSci 2122H: Climate and Life over Billions of years on Earth. Course goals and objectives for ES2122H are consistent with GEC goals and objectives (Appendix A). Direct testing with embedded questions related to expected learning outcomes 1-4. Results of the assessment will be analyzed. Faculty will meet to assess ways to improve student learning and to reassess the evaluation method. Evaluation will be repeated regularly to ensure continued success of the course.

## II. Report

### a. Brief description of the course

EarthSci 2122H, Climate and Life over Billions of years on Earth, meets the University's BS and BA Natural Science GEC requirement and provides a laboratory experience for undergraduates. This course aims to provide a basic understanding of Earth history, including interaction of life and the environment through 4.5 billion years of geologic time. Gain appreciation of the interdisciplinary nature of Earth history and in-depth understanding of concepts of geologic time and plate tectonics. The syllabus for this course (III Appendix 1) includes a goals statement for GEC Natural Science courses and lists core learning objectives for EarthSci 2122H, which describe how this course meets the GEC goals and objectives for this category.

Each faculty member is given significant latitude in the content and sequence in their course, reflecting the diverse backgrounds and interests of the faculty. However, each instructor directly addresses the Expected Learning Outcomes and the requirements for the Ohio Transfer Module.

A single lab section of ~25 students is taught by a GTA on main campus and faculty on regional campuses. GTAs attend a mandatory training session annually and weekly preparation meetings led by the head GTA and are overseen by the coordinator for this course. The chair of the graduate committee oversees the student evaluation of instruction (SEIs) including student comments for GTAs and addresses issues as they arise.

### b. Summary of assessment data collected for each GE ELO

Section III, Appendix 2 outlines the specific learning objectives for EarthSci 2122H and embedded questions will be used as direct assessment. The method of embedded testing will be used to evaluate whether this course is meeting its objectives. Each instructor will ensure at least 2 of the questions associated with each learning objective are embedded in an exam at some point in the semester. Each test question will relate directly to a course and GEC learning objective and to specific content of Earth Science (as indicated in italics below each question) to ensure breadth of coverage. These questions will be approved by the faculty of the School of Earth Science.

Our goal in this assessment is that 75% of students give the correct answer for the embedded multiple-choice test. Questions for which fewer than 75% of students give a correct answer or disagree with meeting the objectives will be pinpointed as areas of weakness.

c. Communication of results.

Results of the assessment will be communicated to the faculty team teaching the course and the School of Earth Science Curriculum Committee after each semester in which an assessment takes place.

d. Actions taken based on evidence.

If results are not satisfactory of any of the 9 embedded test questions, The Associate Director of the School of Earth Sciences will organize a meeting with faculty to plan, as a group, ways to adjust delivery methods to improve student learning or to decide whether the test questions instead need to be adjusted in terms of scope, subject or wording.

e. Next steps

The embedded test question procedure will be repeated annually to test for improvement and ensure that the course continues to meet GEC goals and learning objectives. We will also explore ways to assess the labs in future faculty and GTA meetings

Appendix 2

<b>GE Expected Learning Outcomes</b>	<b>Methods of Assessment</b> *Direct methods are required. Additional indirect methods are encouraged.	<b>Level of student achievement expected for the GE ELO.</b> (for example, define percentage of students achieving a specified level on a scoring rubric)	<b>What is the process that will be used to review the data and potentially change the course to improve student learning of GE ELOs?</b>
<b><u>ELO 1</u></b> Students understand the basic facts, principles, theories and methods of modern science.	Two of the questions addressing ELO 1,	75% of students give the correct answer for the embedded multiple-choice test questions, averaged across all sections.	Standardized questions for which fewer than 75% of students give a correct answer will be pinpointed as areas of weakness.
<b><u>ELO 2</u></b> Students learn key events in the development of science and recognizes that science is an evolving	Two of the questions addressing ELO 2,	75% of students give the correct answer for the embedded multiple-choice test questions,	An <i>ad hoc</i> committee of EarthSci 2122H

body of knowledge.		averaged across all sections.	instructors and the Curriculum Committee will be formed to develop questions and address the weaknesses that are found following the question implementation.
<b><u>ELO 3</u></b> Students provide examples of the interdependence of scientific and technological developments.	Two of the questions addressing ELO 3,	75% of students give the correct answer for the embedded multiple-choice test questions, averaged across all sections.	
<b><u>ELO 4</u></b> Students recognize social and philosophical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world.	Two of the questions addressing ELO 4,	75% of students give the correct answer for the embedded multiple-choice test questions, averaged across all sections.	

**EMBEDDED TEST QUESTIONS**