

## 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 change the number from 1122 to 2122

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	2122
<a href="#">Previous Value</a>	1122
Course Title	Climate and Life over Billions of years on Earth
<a href="#">Previous Value</a>	Earth Through Time
Transcript Abbreviation	Earth Climate Life
<a href="#">Previous Value</a>	Earth Through Time
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, 4 Week
Flexibly Scheduled Course	Sometimes
Does any section of this course have a distance education component?	No

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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

### Exclusions

Not open to students with credit for Earth Sci 1122

### [Previous Value](#)

Not open to students with credit for Geol Sci 122 or Earth Sci 122.

### Electronically Enforced

Yes

### [Previous Value](#)

**No**

## 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

The course is an elective (for this or other units) or is a service course for other units

## 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 Microsoft Excel to organize and analyze data

### [Previous Value](#)

**Content Topic List**

- Origin of Earth
- Origin of life
- Plate tectonics and climate
- Sedimentary rocks
- Ice Ages
- Mass extinctions
- Precambrian Earth history
- Paleozoic Earth history
- Mesozoic Earth history
- Cenozoic Earth history

**Sought Concurrence**

No

**Attachments**

- EarthSci2122\_GEC\_Learning\_Assessment\_Report.docx: GEC Course Assessment plan  
*(GEC Course Assessment Plan. Owner: Panero, Wendy R)*
- ES2122 syllabus.docx: syllabus  
*(Syllabus. Owner: Panero, Wendy R)*

**Comments**

- Note: the submitted syllabus was developed at OSU Newark, but the course content and philosophy is the same at all OSU campuses. *(by Panero, Wendy R on 08/28/2019 12:36 PM)*

**Workflow Information**

Status	User(s)	Date/Time	Step
Submitted	Panero, Wendy R	08/28/2019 12:36 PM	Submitted for Approval
Approved	Panero, Wendy R	08/28/2019 12:42 PM	Unit Approval
Approved	Haddad, Deborah Moore	08/28/2019 02:19 PM	College Approval
Pending Approval	Vankeerbergen, Bernadette Chantal Oldroyd, Shelby Quinn Hanlin, Deborah Kay Jenkins, Mary Ellen Bigler	08/28/2019 02:19 PM	ASCCAO Approval

## **Earth Sciences 2122: Climate and Life over Billions of years on Earth**

### **School of Earth Sciences**

**Earth Sciences 2122 Course Description:** In Earth Sci 2122, 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 2122 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 2122 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

**Student Responsibility:** Each student receives this information in the first lecture section. It is your responsibility to read this material and be familiar with the course content, procedures, and grading. You are also responsible for any announcements concerning course procedures

that are made in class. **If you are absent, you are expected to get notes, announcements, etc. from another student in the class.**

**Course Format:** Course meetings comprise lectures, discussions, group activities, and lab exercises, so please always be prepared to participate.

**Academic Misconduct:** *Any material submitted in Earth Science 2122 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>.

*If you have any questions about whether you are acting in accordance with the Code of Student Conduct, please ask me BEFORE an assignment is turned in.*

**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) at 226 Warner Center, (740) 366-9441. 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.** Accommodations are not retroactive.

**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 Newark Counseling Services. All current OSU Newark students are eligible for services at no charge. You may contact Counseling Services at 740-364-9578.

**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>.

**Land Acknowledgement:** The Ohio State University acknowledges that its campuses have long served as sites of meeting and exchange for Indigenous peoples, including those in historical times known as the Shawnee, Miami, Wyandotte, Delaware, and the People of Fort Ancient, Hopewell, and Adena cultures, also known as the earthworks builders, as well as other tribal nations of the region. The Ohio State University honors and respects the diverse Indigenous peoples connected to this land in which we gather.

**OSU Newark Weather Delays and Cancellations Policy:** The policy at Ohio State Newark is to remain open and operational for classes during times of difficult weather, even as local and regional schools delay or close, unless conditions are severe enough to endanger personal safety. Individual safety for both students and faculty/staff is the highest priority, and every individual is free to make whatever decisions necessary to ensure personal safety. When weather conditions warrant closing the campus, we will try to get that information to the media by 6:00 a.m.

The following guideline will be in operation unless the decision has been made to close the campus:

**If campus is open, all students are expected to make a reasonable effort to attend classes. Any student feeling that travel would unduly endanger their safety may elect to not attend class, and should be allowed to make up the necessary work without penalty. Students are accountable for any material and assignments missed during an absence without an official delay or announced cancellation.**

## Course Grade:

Exams	40%
Weekly Quizzes	15%
Labs/Assignments	15%
Final Paper	20%
Engagement	10%

**Grading Scale:** When all of the points are totaled, the following scale will be used to assign a final letter grade--- 93-100 A; 91-92.99 A-; 89-90.99 B+; 80-88.99 B; 78-79.99 B-; 76-77.99 C+; 65-75.99 C; 63-64.99 C-; 61-62.99 D+; 50-60.99 D; <50 E

**Assignment Due Dates:** In general, lab assignments will be due one week after they are assigned. ***Late work will be penalized. I will not accept work after the key has been posted online.*** If you need accommodation for turning in an assignment late, please make an arrangement with me BEFORE the due date. **In the case of a missed class, you will still be responsible for turning in the assignment on its due date.** Please be aware, that ***some in-class assignments cannot be made up. I will drop the lowest assignment grade.***

**Exams:** Your exam grade for the course will be based on the three highest exam grades (I will drop the lowest exam grade). This means that the final exam may be optional, if you are happy with your first 3 exam grades.

**Absences:** Attendance of class is part of your “engagement” with the class. In addition, in-class labs are not always able to be made up. ***Attendance is therefore mandatory.*** In the case where you must be absent from class, please consult with me as soon as you know that a conflict exists. Exams are a scheduled part of this course and attendance is required. If you know you have a conflict with a scheduled exam, please let me know well in advance of the scheduled exam.

**Expectations for Classroom Conduct:** In the spirit of this institution’s values of inclusion, diversity, collaboration, and integrity, and in an effort to ensure that this class remains a place where everyone can feel safe, comfortable, and welcome, I ask that you:

- behave in a safe and responsible manner at all times
- treat students, staff, and faculty with respect at all times
- be mindful of how your actions and language impact others

**Extra Credit:** As the opportunity arises, I will make you aware of geology-related talks/events that you may attend to earn extra credit.

## Schedule for Earth Sciences 2122

### **Foundational Principles**

Weeks 1-3                      Sedimentary rocks and features  
  
  Depositional Environments  
  
  Geologic Time and Dating  
  
  Stratigraphy  
  
  Plate Tectonics

### **The Early Earth**

Weeks 4-5                      Origin of Earth and the Solar System  
  
  Snowball Earth  
  
  The Archean and the origin of life

### **The Paleozoic**

Weeks 6-9                      Cambrian explosion of Life  
  
  Paleozoic tectonics, climate, and life  
  
  Mass Extinctions

### **The Mesozoic**

Weeks 10-12                      Mesozoic tectonics, climate, and life  
  
  The rise of dinosaurs  
  
  The End-Cretaceous extinction

### **The Cenozoic**

Weeks 13-14                      Cenozoic tectonics, climate, and life  
  
  The Anthropocene and Anthropogenic climate change

**GEC COURSE ASSESSMENT PLAN AND REPORT FOR  
EARTHSCI 2122: 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 2122: Climate and Life over Billions of years on Earth. Course goals and objectives for ES2122 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 2122, 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 2122, 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.

Lecture sections are divided into lab sections of ~25 students each and are taught by GTAs 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 2122 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 2122

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 inter-dependence 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**