

Landing page with course overview; course materials linked in table of contents on left

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Introduction to the Earth: Merged 001-010 GEOL101-000-SPRING-2021 Course Info

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Course Info

Welcome to GEOL 101!

Welcome! This course introduces the science of geology, with an emphasis on physical processes that form and transform our planet. In this course, the Earth is viewed as a single, dynamic system, composed of four principal components: Geosphere (the solid Earth), Atmosphere (the gaseous outer envelope of the Earth), Hydrosphere (the liquid water component of the Earth), and Biosphere (the living component of the Earth). This course provides a detailed overview of how the scientific method is applied, in the context of the fundamental laws of physics and chemistry, to understand the Earth System, with particular emphasis being placed on the Geosphere component. The overarching goal of the course is to create scientifically literate citizens who are willing and able to participate responsibly in a global community by: (1) carefully applying the scientific method as a tool for problem solving, in general; (2) critically evaluating the scientific merit of anything that is presented as science (is it really science?), especially in the area of geology; and (3) thoroughly incorporating geologic knowledge in important decisions and issues at the personal, local, national and global levels. Sample topics include plate tectonics, earthquakes, volcanoes, minerals & rocks, fossils & evolution, geologic time, streams and groundwater.

LEARNING OUTCOMES: *Upon successful completion of GEOL 101, students will be able to...*

- Identify and explain the fundamental processes that operate on Earth's surface and within Earth's interior;
- Describe how our lives are influenced by these processes and, when and how human actions modify the processes;
- Evaluate the application of scientific principles in Earth science related articles presented in the mass media;
- Apply problem-solving skills such as analysis, synthesis and interpretation to real-world scenarios.

How is this semester going to run?

This is a fully online course that will be taught through a mix of synchronous and asynchronous techniques. Your instructors have carefully considered feedback from past students and research on how people learn geology to design this course. The course is organized into three exam blocks, each with multiple labs.

Synchronous meetings will be held at two times each week via Zoom (see links at left): once at the regularly scheduled LECTURE meeting time on Thursday, and again at your regularly scheduled LAB time.

Tuesday lecture (asynchronous): Watch the assigned lecture videos and start work on your assignments for the week.
Thursday lecture (synchronous): Join our class meeting to be put into a small group to work on and get feedback on your assignments. Your breakout rooms will be based on your lab section when possible so that you're working with people you know. Your lecture team (Dr. Ryker, Lance Tully) will be circulating to answer questions and check in on how your groups are doing.
Lab meeting (synchronous): Meet with your lab instructor during your regularly scheduled lab time to get instruction on the labs and work on the lab assignments. Check your schedule on my.sc or the Zoom Links tab to the left to find your section number and meeting time.
Office hours (synchronous): Stuck outside of our class meeting times? Check in with Dr. Ryker, Lance or your lab instructor to get unstuck! We are happy to answer your questions about geology in general, or the course. All lab-related questions should be directed to your lab instructor; see syllabus for their contact information.

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We figured most initial questions would be about the format of the class, any required meetings, and how to get help, so that information was always on the landing page.

Quick access to things like the syllabus, office hours, and Zoom links for live class meetings, plus lecture and lab materials.

Tully & Ryker, Earth Educators' Rendezvous 2021

Lecture organization: Materials organized by exam, with quick links to readings and quizzes

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Introduction to the Earth: Merged 001-010 GEOL101-000-SPRING-2021 Lecture Modules

Lecture Modules

- Exam 1 Materials, Spring 2021**
This Exam 1 unit includes two modules: 1) Geology and the Scientific Process (Week 1) and 2) The Changing Solid Earth (and the Origin of South Carolina) (Weeks 2-5). Within this unit, you will have readings on Perusall, two mastery quizzes, weekly learning journals (homework), and three labs. Each of these are linked within the learning modules below.
- Exam 2 Materials, Spring 2021**
This Exam 2 unit covers Reading Rocks to Interpret Earth's History. Within this unit, you will have readings on Perusall, two mastery quizzes, weekly learning journals (homework), and four labs. Each of these are linked within the learning modules below; the labs can be found under the Lab Modules tab to the left.
- Exam 3 Materials, Spring 2021**
This Exam 3 unit includes two modules: 1) Life's Effect on Earth; Earth's Effect on Life (Weeks 11-12) and 2) Water and Society (Weeks 13-15). Within this unit, you will have readings on Perusall, two mastery quizzes, weekly learning journals (homework), and four labs. Each of these are linked within the learning modules below; the labs can be found under the Lab Modules tab to the left.
- Perusall Readings - Use these links if those in the "Week X" folders don't work for you.**
- Mastery & Practice Quizzes**

Course materials should always be organized as consistently as possible to reduce student stress. This was especially true when everyone was getting used to multiple new online formats. Keeping things organized help reduce our stress too!





Lecture Modules for Exam 1: Materials organized by week with synopsis of topics covered



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Introduction to the Earth: Merged 001-010 GEOL101-000-SPRING-2021 Lecture Modules Exam 1 Materials, Spring 2021



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Exam 1 Materials, Spring 2021

-  [Exam 1 Learning Objectives and Readings](#) 
-  [Week 1: Geology and the Scientific Process, 1/11/21](#) 

This week, you will learn how this course is organized and how you'll be graded, get practice interacting with our Open Geology textbook, and help us get to know you through a few short surveys.
-  [Week 2: Earth's Interior & Introduction to Plate Tectonics, 1/18/21](#) 

This week, you will learn about Wegener's continental drift hypothesis, the layers of the Earth, and get an introduction to plate tectonics, including the different types of convergent boundaries.
-  [Week 3: Plate Tectonics, continued, 1/25/21](#) 

This week, you will learn about divergent and transform plate boundaries, hot spots, and more on the geologic history of the Earth over the last 600 million years - including the origins of South Carolina.
-  [Week 4: Earthquakes, 2/1/21](#) 

This week, we will dive deeper into earthquakes - where and how they form, as well as how they are measured.
-  [Week 5: Volcanoes, 2/8/21](#) 

This week, you will learn about volcano types and hazards, particularly as they are related to the different plate boundaries.

Exam materials always start with a handout of the learning objectives and readings all in one place.

Each week includes the start date to remind students which week they're working on, or find materials from a week they missed.

Sample week from Exam 1 materials

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- Video: Divergent and Transform Plate Boundaries, Hot Spots
- Slides: Divergent and Transform Plate Boundaries, Hot Spots
- Video: Plate Tectonics Over Time and the Origins of South Carolina
- Slides: Plate Tectonics Over Time and the Origins of South Carolina
- Week 3 Learning Journal
- Finish attempts of Quiz 1: Geology, the Scientific Process
- Survey: Spatial-Science Views
- Video: Thursday's synchronous class
- Slides: Thursday's synchronous class

Module Overview

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Goals

This week, you will learn about divergent and transform plate boundaries, hot spots, and more on the geologic history of the Earth over the last 600 million years - including the origins of South Carolina.

Task List

Readings: Chapter 2, sections 4-7

Videos: Divergent and Transform Plate Boundaries, Hot Spots; Plate Tectonics Over Time and the Origins of South Carolina

Assignments: Chapter 2 reading through Perusall; one survey; Week 3 Learning Journal; Quiz 1

Lab: M: Introduction to Science & the Scientific Method; Tu-Th: Tectonic Plate Boundaries

Materials are presented in the order we suggest completing them: read the book, watch the lecture videos (with slides provided), complete the Learning Journal, attempt/finish the mastery quiz, complete the survey, and watch the video from Thursday's synchronous class if you missed it (with slides provided). Formatting (e.g., "Video: XYZ") and order are consistent from week to week.

Each week includes the big picture goal and a list of tasks that must be completed by Friday at 5pm.



Labs for Exam 1: With seven lab sections, sometimes labs were split across weeks

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Lab Modules


 **Lab start date** 


Labs will start Tuesday, January 19th. Please see my.sc.edu or the Zoom Links: Lecture & Lab tab to the left to find your lab section number, meeting day and time. Labs will be posted here at least the week before they are scheduled to give you time to look them over.

 **[Lab 1: Introduction to Science & the Scientific Method](#)**

 **[Lab 2: Tectonic Plate Boundaries](#)**

 **[Lab 3: Earthquakes](#)**

 **[Lab 4: Minerals](#)**

 **[Lab 5: Igneous Rocks and Volcanoes](#)**

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3. Background Information for Lab

4. Lab 5: Igneous Rocks

5. Lab Interest Survey

6. Link to lab powerpoint

Purpose / Introduction

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Volcanic activity creates natural hazards, stunning vacation spots, fertile soil and valuable ores. Geologists use volcanoes not only to understand Earth's current dynamic system, but also to decode its complicated history. To understand how rocks form and change around the world, we need to understand how igneous rocks form and what factors influence the characteristics of an igneous rock.

Each lab page starts with a brief purpose/introduction, followed by more detailed learning objectives and any necessary background information. Next is the lab, a survey to learn more about the student experience, and a link to the lab PowerPoint used by the graduate student instructors.