Master Course Syllabus

For additional course information, including prerequisites, corequisites, and course fees, please refer to the Catalog: https://catalog.uvu.edu/

Semester: Spring
Year: 2025
Course Prefix: GEO
Course and Section #: 1010-014
Course Title: Introduction to Geology
Credits: 3

Course Description

This 3-credit course is designed to provide a broad introduction to Geology and Earth Sciences and to prepare you to think critically about what constitutes scientific knowledge and how such knowledge is produced and used. We will discuss the composition of the Earth (what elements, minerals, and rocks make up our planet?). We will study the structure and dynamics of Earth (how it's organized and how it changes through time). We'll also investigate surface features of the Earth (mountains, valleys, rivers, and more). All these things are important to understanding issues of global sustainability, the extraction and efficient use of all the natural resources used in our technological world, and appreciation of the natural world around us.

The goal of the class is to build a foundation of knowledge about geology and pair that with basic analytical skills so you can evaluate critical issues related to the environment and society throughout your life. In doing this we may call upon (and learn/practice) basic math skills (algebra, geometry, and arithmetic), introductory physics concepts (force/area = stress, energy, wavelengths, reflection/refraction, etc.), and introductory chemistry concepts (chemical bonds, chemical phase diagrams), as well as your own interest and familiarity with current topics in geology (mineral exploration, energy production, climate change, geologic hazards, and more).

Course Attributes

This course has the following attributes:
☒ General Education Requirements
☐ Global/Intercultural Graduation Requirements
☐ Writing Enriched Graduation Requirements
☒ Discipline Core Requirements in Program
☒ Elective Core Requirements in Program
☒ Open Elective
Other: *Click here to enter text.*

Instructor Information

Instructor Name: Dr. Nathan Toké

Student Learning Outcomes

Learning Objectives:

1) Students will learn the basic **principles of geology** that will prepare them for entering the UVU Earth Sciences majors: https://www.uvu.edu/college-of-science/earth-science/programs/
Official Course Learning Objectives *and connection to UVU Essential Learning Outcomes (ELOs): Upon successful completion, students should be able to . . .*
1 Identify major rock types and rock forming minerals. Tied to UVU's ELO of informational literacy.
2 Explain the role of different rock types and rock forming minerals in plate tectonics, the rock cycle, and surficial and interior geological processes. Tied to UVU's ELO of scientific literacy.
3 Describe the geologic time scale. Tied to UVU's ELO of scientific literacy.
4 Explain the ways in which geologic resources and geologic data benefits society. Tied to UVU's ELO of informational literacy.
5 Critically evaluate popular news articles and proposed policies related to Geology and the Earth Sciences. Tied to UVU's ELOs of critical thinking and ethical reasoning.
6 Apply the laws and principals of relative and absolute dating to evaluate geologic cross sections and maps. Tied to UVU's ELO of informational literacy.
7 Apply the scientific method, including multiple working hypotheses, to analyze and evaluate geologic data and problems outside of the classroom. Tied to UVU's ELOs of scientific literacy and informational literacy.

2) Students will **develop a pattern of critical and creative evaluation**, aligned with the scientific method, but also applicable to fields outside of science. Students will be able to **apply their knowledge and critical thinking skills** to carry out their own geologic investigation or critical evaluation of a current issue in the news about geology related to this objective, students will remember these guiding principles
    a. Scientific, or even more generally, critical thinking is about ***identifying problems***, being able to ***develop hypotheses*** that might explain (or solve) those problems, then ***finding the appropriate tools and data*** to test those hypotheses, and finally it is about ***appropriately assessing the results*** of those analyses.
    b. It is generally true that people with only one working hypothesis are extremely unlikely to find an adequate solution to a scientific or social problem. With each additional working hypothesis more can be learned. Thus, investigators should always strive to develop multiple working hypotheses when they are conducting research.

3) Students will be able **discuss/debate issues constructively** with their peers, both during collaborative work and when giving feedback on other projects.

4) Students will be able to **communicate their ideas effectively via written and oral forms of communication**.

Course Materials and Texts

Required Textbook: Essentials of Geology by Stephen Marshak 7th edition
ISBN-13: 978-0393882728
ISBN-10: 0393882721

Course Requirements

Course Assignments, Assessments, and Grading Policy
Grades are based upon the following assessment activities:

Assignment Type	**Number**	**% of grade**
Warm Up Activities	**~20**	**10%**
Short thought questions and/or warm up discussions to motivate day's learning. The two lowest scores will be dropped.		
In-class Activities	**~12**	**25%**
Worksheets or notes are handed in as a group or individually. Either occurs at the start of class or after a short lecture. Participation in group discussion is evident. No scores dropped.		
Online Journals	**10**	**20%**
Questions to guide your reading assignments answer them in full and coherent sentences. No scores dropped. Will be associated with in-class activities and warm up activities.		
Online Quizzes	**3**	**25%**
Take the place of midterm exams, open-book, online Canvas quizzes.		
Final Exam (Wednesday April 30th @ 1pm in PS 115)	**1**	**20%**
Exam evaluating geologic data, showing evidence of critical thinking and knowledge of the basic principles of geology.		

Due Dates and Late Work Statement: Journals will have due dates listed on canvas, they will not close (i.e., I want you (*not AI*) to complete all the journals over the semester). Journals that come in after I have graded the assignment will receive a 5% late penalty. Journals that are more than 1 week late will receive a 20% late penalty. Warm Up Activities are like pop quizzes that check attendance. They cannot be made up. I will drop the lowest two of these activities (insurance for unforeseen issues with getting to class on time). In Class Activities can be made up during office hours or on your own time by request when you have to miss class but must be completed within two weeks of the in-class activity. Online Quizzes will be open for ~1 week, so late work is not accepted. The Final Exam date, time and location is stipulated by the University and cannot be adjusted. If you have a conflict with the final exam, you must identify it and contact me about other arrangements as soon as possible. All make up work is due before the final exam period.

Grading

94-100% =	A	(demonstrates a mastery! of the learning objectives)
90-93.9%=	A-	
87-89.9%=	B+	
84-86.9%=	B	(demonstrates a functional level of the learning objectives)
80-83.9%=	B-	
77-79.9%=	C+	
74-76.9%=	C	(demonstrates basic achievement of learning objectives)
70-73.9%=	C-	
67-69.9%=	D+	
64-66.9%=	D	(met some learning objectives, has significant deficits)
60-63.9%=	D-	
0-60%=	E	(failure to demonstrate an understanding of learning objectives)

Required or Recommended Reading Assignments

See table below within *General Description of the Subject Matter*

General Description of the Subject Matter of Each Lecture or Discussion

Semester Schedule/Plan (yellow= Holiday).

Week	Readings	Monday	Wednesday
1 (Jan 6) ORIGINS AND STRUCTURE OF EARTH	*Prelude And Chapter 1*	*Purchase Book* Lecture: Earth Origins, Deep Time and Habitability	Lecture: Planetary Formation and Earth Structure
2 (Jan 13) PLATE TECTONICS	*Chapter 2*	*Earth Structure continued*	***Journal 1*** Lecture: Plate Tectonic Boundaries
3 (Jan 20) GEOCHEMISTRY AND MINERALS	*Chapter 3 And Interlude A*	Martin Luther King Jr. National Holiday *(No class)*	***Journal 2*** Lecture: Rocks vs Minerals
4 (Jan 27) IGNEOUS ROCKS	*Chapter 4*	Rock Groups and Mineral ID	***Online Quiz 1*** Lecture: Igneous Rocks
5 (Feb 3) VOLCANIC ERUPTIONS	*Chapter 5*	***Journal 3*** Volcanism on Earth	Lecture: Volcanic Hazards Volcano Classification and Hazards
6 (Feb 10) WEATHING AND SOILS	*Interlude B*	**No Class**, Dr. Toke at Utah Faults Meeting **Online Recorded Lecture**: Weathering and Soils	***Journal 4*** Lecture: Sediments and Depositional Environments
7 (Feb 17) SED ROCKS	*Chapter 6*	*Presidents' Day Holiday (No Class)*	Lecture: Sedimentary Rock Formation + Fossils
8 (Feb 24) METAMORPHIC ROCKS	*Chapter 7 And Interlude C*	***Journal 5*** Lecture: Metamorphism	Lecture: Metamorphic Rocks
9 (Mar 3) EARTHQUAKES/ SEISMOLOGY	*Chapter 8 and Interlude D*	***Journal 6*** Lecture: Seismology and Seeing into the Earth	***Online Quiz 2*** Lecture: Earthquake Geology and Hazards in Utah
9 (Mar 10) Spring Break		*No Class*	*No Class*

10 (Mar 17) MOUNTAIN BUILDING + GEOLOGIC TIME	*Chapter 9*	***Journal 7*** Lecture: Mountain Building and Rock Deformation	Lecture: Geologic Time I Deformation and Geologic Time
11 (Mar 24) RELATIVE AGE	*Chapter 10 and Chapter 11*	***Journal 8*** Lecture: Geologic Dating	Relative Timing of Geologic Events
12 (Mar 31) RESOURCE GEOLOGY	*Chapter 12*	***Journal 9*** **Lecture**: Earth Resources	Lecture: Resource Horizon and Carbon Capture
13 (April 7) LANDSLIDES AND RIVERS	*Chapters 13-14 And Interlude F*	***Journal 10*** Lecture: Rivers and Landslides	***Online Quiz 3*** Rivers and Landslides Part 2
15 (April 14) HUMAN-ENVIRONMENTAL INTERACTIONS	*Chapters 16, 18 and 19*	***Journal 11*** Lecture: Global Impact – Humans and Geology	*Read Chapters 16, 18 and 19* Lecture: Global Impact – Humans and Geology
16 (April 21) REVIEW		Practice Final Exam	*No class Reading Day* ***Optional Extra Credit Field Trip***
	17: **Final Exam Data/Time:**		**Monday April 28th 3-5pm in PS 115**

Required Course Syllabus Statements

Generative AI

This course requires you to complete assignments that assess your understanding, application, and problem-solving ability applied to geology and physical science. You are expected to do your own work. Problem solving and scientific thinking are tools that are necessary for students to learn in this course. The use of artificial intelligence (AI) tools, such as chatbots, text generators, paraphrasers, summarizers, or solvers, is only permitted to help students gain an understanding of content. Copying AI outputs or any sources will be treated as any other form of plagiarism (academic dishonesty) and will be handled according to the university's academic honesty policy. Instead, you can use AI like you would a textbook or internet search, to help you gain understanding of a subject. ***Use AI sparingly because it is an extremely energy and water intensive cloud-based software tool. Every time you use it; it costs about 1 liter of water and significant energy resources.*** After you've read and consulted with other sources (textbook, class notes, etc.) then write a response to journal and quiz questions that is your own original language. Please also note that AI hallucinates and often feeds students incorrect information, especially in subjects like geology. It is easy to spot AI responses because of their overly detailed examples with interspersed hallucinations. Note that for this class, assignments that are determined to be plagiarized will receive a zero and warning for the first offense. The second offense will result in negative points, and I will report you to the administration for academic dishonesty. A third offense may result in immediate failure of the course. If you have questions about acceptable use of AI tools, please consult the instructor before submitting your work.

Using Remote Testing Software
☒ This course does not use remote testing software.

☐ This course uses remote testing software. Remote test-takers may choose their remote testing locations. Please note, however, that the testing software used for this may conduct a brief scan of remote test-takers' immediate surroundings, may require use of a webcam while taking an exam, may require the microphone be on while taking an exam, or may require other practices to confirm academic honesty. Test-takers therefore shall have no expectation of privacy in their test-taking location during, or immediately preceding, remote testing. If a student strongly objects to using test-taking software, the student should contact the instructor at the beginning of the semester to determine whether alternative testing arrangements are feasible. Alternatives are not guaranteed.

Required University Syllabus Statements

Accommodations/Students with Disabilities
Students needing accommodations due to a permanent or temporary disability, pregnancy or pregnancy-related conditions may contact UVU Accessibility Services at accessibilityservices@uvu.edu or 801-863-8747.

Accessibility Services is located on the Orem Campus in BA 110.

Deaf/Hard of Hearing students requesting ASL interpreters or transcribers can contact Accessibility Services to set up accommodations. Deaf/Hard of Hearing services can be contacted at DHHservices@uvu.edu

DHH is located on the Orem Campus in BA 112.

Academic Integrity
At Utah Valley University, faculty and students operate in an atmosphere of mutual trust. Maintaining an atmosphere of academic integrity allows for free exchange of ideas and enables all members of the community to achieve their highest potential. Our goal is to foster an intellectual atmosphere that produces scholars of integrity and imaginative thought. In all academic work, the ideas and contributions of others must be appropriately acknowledged and UVU students are expected to produce their own original academic work.

Faculty and students share the responsibility of ensuring the honesty and fairness of the intellectual environment at UVU. Students have a responsibility to promote academic integrity at the university by not participating in or facilitating others' participation in any act of academic dishonesty. As members of the academic community, students must become familiar with their rights and responsibilities. In each course, they are responsible for knowing the requirements and restrictions regarding research and writing, assessments, collaborative work, the use of study aids, the appropriateness of assistance, and other issues. Likewise, instructors are responsible to clearly state expectations and model best practices.

Further information on what constitutes academic dishonesty is detailed in UVU Policy 541: *Student Code of Conduct*.

Equity and Title IX
Utah Valley University does not discriminate on the basis of race, color, religion, national origin, sex, sexual orientation, gender identity, gender expression, age (40 and over), disability, veteran status, pregnancy, childbirth, or pregnancy-related conditions, citizenship, genetic information, or other basis protected by applicable law, including Title IX and 34 C.F.R. Part 106, in employment, treatment, admission, access to educational programs and activities, or other University benefits or services. Inquiries about nondiscrimination at UVU may be directed to the U.S. Department of Education's Office for Civil Rights or UVU's Title IX Coordinator at 801-863-7999 – TitleIX@uvu.edu – 800 W University Pkwy, Orem, 84058, Suite BA 203.

Religious Accommodation
UVU values and acknowledges the array of worldviews, faiths, and religions represented in our student body, and as such provides supportive accommodations for students. Religious belief or conscience broadly includes religious, non-religious, theistic, or non-theistic moral or ethical beliefs as well as participation in religious holidays, observances, or activities. Accommodations may include scheduling or due-date modifications or make-up assignments for missed class work.
To seek a religious accommodation, a student must provide written notice to the instructor and the Director of Accessibility Services at accessibilityservices@uvu.edu. If the accommodation relates to a scheduling conflict, the notice should include the date, time, and brief description of the difficulty posed by the conflict. Such requests should be made as soon as the student is aware of the prospective scheduling conflict.

While religious expression is welcome throughout campus, UVU also has a specially dedicated space for meditation, prayer, reflection, or other forms of religious expression.