North Central State College

MASTER SYLLABUS	2025-2026

A. Academic Division: Liberal Arts

B. Discipline: Physical Science

C. Course Number and Title: GEOL1010 Physical Geology

D. Assistant Dean: Laura Irmer

E. Credit Hours: 4
Lecture: 3 hours
Laboratory: 2 hours

F. Prerequisites: None

G. Last Course/Curriculum Revision Date: Fall 2023 Origin date: 02/22/2017

H. Textbook(s) Title:

Essentials of Geology (Loose leaf)
- Author: Lutgens, Tarbuck & Tasa
- Copyright: 2017
- Edition: 13
- ISBN # 9780134663777

I. Workbook(s) and/or Lab Manual: None

J. Course Description: Physical Geology is an introductory course describing the fundamental concepts of Geology for Non-Science majors. These fundamental concepts are grouped in 7 modules. **Module I** (*Geology, Earth Science, and the Scientific Method*) is an introduction to the science of Geology and its many branches; this module also discusses the steps in the scientific method, and describes the systems approach to geology. **Module II** (*Origin and Evolution of Earth*) discusses the formation of the universe and the solar system, and introduces Earth's neighbors in the solar system. **Module III** (*Plate Tectonics and the Dynamic Earth*) discusses Earth's internal structure and introduces the theory of plate tectonics, a unifying idea that explains Earth's surface processes and features. **Module IV** (*Earth Materials: Minerals and Rocks*) discusses the materials from which Earth is made, as well as their structure and classification. **Module V** (*Structural Geology*) describes how Earth's internal and external processes interact to produce earthquakes and mountains. **Module VI** (Energy Resources) describes the energy resources that the Earth provides us and how they are produced and used. **Module VII** (*Hydrology and Stream Geomorphology*) discusses how water shapes the surface of our planet and helps create a multitude of erosional and depositional landforms. TAG# OSC025

K. College-Wide Learning Outcomes

College-Wide Learning Outcomes	Assessments - - How it is met & When it is met
Communication – Written	

College-Wide Learning Outcomes	Assessments - - How it is met & When it is met
Communication – Speech	
Intercultural Knowledge and Competence	
Critical Thinking	
Information Literacy	
Quantitative Literacy	

L. Course Outcomes and Assessment Methods:

Upon successful completion of this course, the student shall:

Outcomes	Assessments – How it is met & When it is met
1. **Describe** several of the many branches of geology and the multiple roles of geoscientists in society; **explain** how scientists use the scientific method; **demonstrate** the systems approach to geology and **identify** the major subsystems of the Earth system; **explain** how these subsystems interact through cycles (hydrologic cycle, rock cycle, tectonic cycle, and biogeochemical cycles).	Reading quiz 1 and video quiz 1; this outcome will be met early in the term (it will also be assessed on the mid-term and final exams).
2. **Recognize** how our understanding of the Universe has changed over time, from ancient Greece to modern discoveries, and what ideas were proposed to determine our place in the Universe; **describe** the theories that explain the formation of the Universe, the Solar System, and planet Earth; **identify** objects of the Solar System (Sun, planets, moons, asteroids, comets, meteoroids), and the differences between terrestrial and Jovian planets.	Reading quiz 2, video quiz 2, and laboratory exercise 1; this outcome will be met early in the term (it will also be assessed on the mid-term and final exams).
3. **Describe** the Earth layering process; **identify** the differences (in composition and physical state) between the layers of our planet (crust, mantle, and core); **identify** the source of Earth's magnetic field; **recognize** Wegener's contribution to the plate tectonics theory and **describe** the key evidence supporting the continental drift idea.	Reading quiz 3, video quiz 3, and laboratory exercise 2; this outcome will be met early in the term (it will also be assessed on the mid-term and final exams).
4. **Explain** how paleomagnetism provided the definitive evidence for continental drift; **describe** the process of seafloor spreading; **demonstrate** how the ideas of continental drift and seafloor spreading combined to form the basis for the plate tectonics theory; **identify** the different types of plate movements and plate boundaries.	Reading quiz 4, video quiz 4, and laboratory exercise 3; this outcome will be met early in the term (it will also be assessed on the mid-term and final exams).
5. **Identify** the defining characteristics of minerals, and **explain** how mineral crystals grow; **describe** the physical properties of minerals; **identify** and **give examples** of the different groups of minerals on Earth; **recognize** the different uses and sources of minerals (metallic and non-metallic) and the processes that form mineral deposits.	Reading quiz 5, video quiz 5, and laboratory exercise 4; this outcome will be met the middle of the term (it will also be assessed on the mid-term and final exams).
6. **Recognize** the difference between magma and lava; **describe** the processes that form magma and influence its composition; **describe** the factors that control the character of volcanic eruptions; **identify** the different products of volcanic eruptions and their formation; **describe** the different shapes and architectural features of volcanoes; **describe** the different styles of volcanism and how they relate to the plate tectonics theory; **identify** the hazards of volcanoes and **describe** how scientists monitor volcanic activity.	Reading quiz 6, video quiz 6, and laboratory exercise 5; assessed on the mid-term and final exams.

Outcomes	Assessments – How it is met & When it is met
7. **Explain** the formation of igneous rocks and **distinguish** between volcanic and plutonic rock types; **identify** the different types of igneous intrusions; **interpret** different textures characteristic of igneous rocks and **explain** the different processes that produce them; **describe** the different classes/types of igneous rocks.	Reading quiz 7, video quiz 7, and laboratory exercise 6; this outcome will be met in the middle of the term (it will also be assessed on the mid-term and final exams).
8. **Identify** the different types and sources of sediments, and the formation of soil and sedimentary rock; **explain** the difference between weathering and erosion, and between physical and chemical weathering; **identify** different sediment textures; **demonstrate** how rock composition and exposure act to produce differential weathering; **distinguish** between erosion and mass wasting; **define** turbulent and laminar flow; **identify** the factors that produce slope failure and sediment flow; **describe** and **give examples** of mass wasting processes.	Reading quiz 8, video quiz 8, and laboratory exercise 7; this outcome will be met lat in the term (it will also be assessed on the final exam).
9. **Describe** the main mechanisms of sediment transport; **define** deposition and **identify** the conditions that commonly lead to the deposition of sediment; **describe** and **give examples** of different types of sedimentary rocks; **describe** and **give examples** of different types of sedimentary structures and depositional environments.	Reading quiz 9, video quiz 9, and laboratory exercise 8; this outcome will be met late in the term (it will also be assessed on the final exam).
10. **Distinguish** between diagenesis and metamorphism; **describe** the different metamorphic processes; **explain** the development of preferred mineral orientation in metamorphic rocks; **demonstrate** the difference between foliated and non-foliated metamorphic rocks and **give examples**.	Reading quiz 10, video quiz 10, and laboratory exercise 9; this outcome will be met late in the term (it will also be assessed on the final exam).
11. **Describe** the different types of faults; **identify** which kind of stress is associated with various types of faults; **explain** how fault formation generates earthquakes; **explain** the difference between an earthquake focus and its epicenter, and between foreshocks and aftershocks; **summarize** the causes and consequences of major historical earthquakes; **define** displacement; **describe** how earthquake energy is transmitted and the different types of seismic waves; **identify** the types of earthquakes that are common in Ohio and the most tectonically active places in the state.	Reading quiz 11, video quiz 11, and laboratory exercise 10; this outcome will be met late in the term (it will also be assessed on the final exam).
12. **Define** the different types of stress; **distinguish** between elastic, brittle, and ductile deformation; **explain** how pressure, temperature, and rock composition affect deformation; **define** craton and orogen; **describe** and **compute** the strike and dip of geologic structures, and **demonstrate** how these measurements are represented on a geologic map; **define** and **describe** the different types of folds; **identify** major mountain ranges on Earth.	Reading quiz 12, video quiz 13, and laboratory exercise 11; this outcome will be met late in the term (it will also be assessed on the final exam).

Outcomes	Assessments – How it is met & When it is met
13. **Describe** how our energy needs have changed overtime and the main sources of energy to our current energy system; **identify** the fundamental sources of energy on Earth; **explain** the difference between renewable and non-renewable resources; **define** fossil fuels and **give examples**; **identify** the sources and formation processes of coal, petroleum, and natural gas; **distinguish** between conventional and unconventional oil-gas systems; **explain** how new technologies (horizontal drilling; hydraulic fracturing) extend the yield of oil-gas plays; **describe** the different forms of alternative energy (nuclear, geothermal, solar, wind, hydro) and their relative contribution to the world energy system.	Reading quiz 13, video quiz 13, and laboratory exercise 12; this outcome will be met late in the term (it will also be assessed on the final exam).
14. **Describe** the hydrologic cycle; **explain** the main pathways in the hydrologic cycle; **identify** the main reservoirs in the hydrologic cycle; **define** residence time; **describe** the processes that control the movement of water between reservoirs; **identify** the source of energy driving the movement of water in the hydrologic cycle; **describe** Earth's heat balance (reflection vs absorption) and how it drives the global distribution of precipitation; **identify** the connections between groundwater and surface water; **describe** the major types of drainage patterns; **explain** how braided, straight, and meandering channels form; **define** concepts such as drainage basin and watershed, discharge and flood-frequency curve; **explain** the formation of stream depositional and erosional features.	Reading quiz 14, video quiz 14, and laboratory exercise 13; this outcome will be met late in the term (it will also be assessed on the final exam).

M. Recommended Grading Scale:

NUMERIC	GRADE	POINTS	DEFINITION
93–100	A	4.00	Superior
90–92	A-	3.67	Superior
87–89	B+	3.33	Above Average
83–86	B	3.00	Above Average
80–82	B-	2.67	Above Average
77–79	C+	2.33	Average
73–76	C	2.00	Average
70-72	C-	1.67	Below Average
67–69	D+	1.33	Below Average
63-66	D	1.00	Below Average
60-62	D-	0.67	Poor
00--59	F	0.00	Failure

N. College Procedures/Policies:

North Central State College believes that every student is a valued and equal member of the community.* Every student brings different experiences to the College, and all are important in enriching academic life and developing greater understanding and appreciation of one another. Therefore, NC State College creates an inclusive culture in which students feel comfortable sharing their experiences. Discrimination and prejudice have no place on the campus, and the College takes any complaint in this regard seriously. Students encountering aspects of the instruction that result in barriers to their sense of being included and respected should contact the instructor, assistant dean, or dean without fear of reprisal.

* *Inclusive of race, color, religion, gender, gender identity or expression, national origin (ancestry), military status (past, present or future), disability, age (40 years or older), status as a parent during pregnancy and immediately after the birth of a child, status as a parent of a young child, status as a foster parent, genetic information, or sexual orientation*

Important information regarding College Procedures and Policies can be found on the syllabus supplement located at
https://ncstatecollege.edu/documents/President/PoliciesProcedures/PolicyManual/Final%20PDFs/14-081b.pdf

North Central State College

SYLLABUS ADDENDUM

Academic Division:	Liberal Arts	**Discipline:**	Physical Science
Course Coordinator:	Dustin Bates		
Course Number:	GEOL 1010-CN1	**Course Title:**	Physical Geology
Semester / Session:	Spring 2026	**Start / End Date:**	01/12/2026 - 05/04/2026

Instructor Information

Name:	Ms. Cynthia Erbacher	**Credentials:**	Master's – Environmental Studies -Point Park University 29 Completed Master's Credit Hours – Environmental Geology – University of Akron Bachelor's – Geology – University of Toledo
Phone Number:	N/A	**E-Mail Address:**	cerbacher@ncstatecollege.edu
Office Location:	N/A	**Office Hours:**	Immediately before or after class or by appointment

I. Topical Timeline / Course Calendar (Subject to Change):

Weeks	Topics	Assignment	Due Date
1	Introduction to Geology Matter and Minerals	1.Scientific Method Lab 2. Mineral 1 Lab 3. Kola Superdeep Borehole 4. Chapter 1 Homework	1: Monday, January 11,2026 2-4: Wednesday, January 14,2026
2	Matter and Minerals	Time Traveling Mineral Lab 2 Chapter 3 Homework	Wednesday, January 21, 2026
3	Igneous Rocks and Intrusive Activity Metamorphism and Metamorphic Rocks	1. Mineral Lab 3 2. Mineral Lab 4 3. Hands On Mineral Activity 4. Igneous Rock Lab 1 5. Chapter 4 Homework	1-2: Monday, January 26, 2026 3-5: Wednesday, January 28, 2026
4	Metamorphic Rocks Sedimentary Rocks	1. Metamorphic Rock Lab 1 2. Hands on Rock Activity 1 3. Hands on Rock Activity 2 4. Chapter 8 Homework	1-2: Monday, February 2,2026 3-4: Wednesday, February 4, 2026
5	Sedimentary Rocks Weathering and Soils	1.Rock Cycle-Sedimentary Rock Lab 1 2. Soil Lab 1 3. Chapter 7 Homework	1: Monday, February 9, 2026 2-3: Wednesday, February 11, 2026

Weeks	Topics	Assignment	Due Date
6	Weathering and Soils	1.Test 1 2. Soil Lab 2 3. Chapter 6 Homework	1.Monday, February 16, 2026 2-3: Wednesday, February 18, 2026
7	Plate Tectonics Volcanoes	1. East African Rift Video 2. Plate Tectonics Lab 1 3. Plate Tectonics Lab 2 4. Volcano Lab 1 5. Chapter 2 Homework	1-2: Monday, February 23, 2026 3-5: Wednesday, February 25, 2026
8	Volcanoes and Earthquakes	1. Volcano Lab 2 2. Volcano Lab 3 3. Volcano Lab 4 4. Earthquake Lab 1 5. Earthquake Lab 2 6. Chapter 5 Homework 7. Chapter 9 Homework	1,2,6: Monday, March 2, 2026 3,4,5,7: Wednesday, March 5, 2026
9		SPRING BREAK	
10	Earthquakes Mountain Building and Crustal Deformation Geologic Time	1. Faults and Folds Lab 2. Relative Dating Lab 1 3. Chapter 11 Homework 4. Chapters 18 and 19 Homework	1,3: Monday, March 16, 2026 2,4: Wednesday, March 18, 2026
11	Geologic Time	1.Test 2 2.Relative Dating Lab 2 3.Relative Dating Lab 3 4.Fossils and Correlation Lab 5.Relative Dating Bonus	1-2: Monday, March 23, 2026 3-5: Wednesday, March 25, 2026
12	Mass Movement Rivers Groundwater	1.Landslide Lab 2.Stream Activity 3. Karst Topography Lab 4.Chapters 12-14 Homework	1-2: Monday, March 30, 2026 3-4: Wednesday, April 1, 2026
13	Groundwater Glaciers and Glaciation	1.Porosity and Permeability Lab 2.Groundwater Lab 1 3.Glacier Lab 1 4.Glacier Lab 2	1-2: Monday, April 6, 2026 3-4: Wednesday, April 8, 2026
14	Glaciers Deserts and Wind	1.Test 3 2.Chapters 15 and 16 Homework 3. Introduction to Oceanography Lab 1 4. Final Presentation	1,2,4: Monday, April 13, 2026 3-4: Wednesday, April 15, 2026

Weeks	Topics	Assignment	Due Date
15	Origins of the Ocean Floor Shorelines	1.Introduction to Oceanography Lab 2 2. Waves, Tides, and Currents Lab 3. Ocean Currents Lab 4. Chapter 17 Homework 5. Final Presentation	1,2,5: Monday, April 20, 2026 3-5: Wednesday, April 22, 2026
16	Shorelines Global Climate Change	1.Shoreline Features Lab 2.Final Presentation	1-2: Monay, April 27, 2026 2: Wednesday, April 29, 2026
17		FINAL EXAM	Monday, May 4,,2026

NOTE: There will be some adjustment to this schedule with homework due dates and with the addition and/or removal of a few labs. There may also be the addition of a few class discussion assignments.

II. Grading and Testing Guidelines:

Final Grade Calculation

Activity	Qty	Points	Percentage
Homework	13	150-325	n/a
Labs	40-45	300-700	n/a
Tests (including final exam)	4	400-430	n/a
Final Presentation	1	100	n/a
Discussion Questions (possibly)	4-6	40-60	n/a

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NOTE: The course does not divide each activity into a percentage but rather uses a total overall point calculation.

For example, if the course ends up with a total of 950 points and a student achieves 830 total points then 830 divided by 950 equals 0.87 times 100 which gives 87% B+ as the overall grade.

1. **Chapter Homework**
   a. There will be a weekly homework assignment over the chapters covered (some chapters may be combined into one assignment.
   b. It may be given as a handout to turn in person, or it may be available and submitted through Canvas.

2. **Labs**
   a. There will be 2 lab sessions per week.
   b. Some will be done as small group assignments. Each student is required to submit their own paper/work.
   c. Some will be done independently.
   d. Some may involve online components so would be done like a homework assignment.
   e. Labs must be turned in prior to leaving the lab session to receive credit, unless otherwise stated.
   f. You will be provided with documents either through Canvas or in person for the labs.
   g. You may need to look up information in advance of a lab session.
   h. There may be a few done in the chemistry lab.
   i. There may be an outside lab.
   j. There may be an offsite visit.

3. **Tests**
   a. Each test will cover 5 chapters.
      - Test 1 will cover Chapters 1, 3, 4, 7, 8
      - Test 2 will cover Chapters 2, 5, 6, 9,11
      - Test 3 will cover Chapters 12, 13, 14, 18, 19
      - Final Exam will cover Chapters 10, 15,16, 17, 20)

   b. Format primarily is multiple choice but there can also be some short answer, and photos or diagrams to analyze.
   c. The test is given in person on paper.
   d. Study guides and sample test questions will be provided in Canvas

4. **Final Presentation**
   a. This will be an individual assignment done in the last weeks of the course.
   b. Some may be done during the lecture time, but most will be completed during the lab session.
   c. It will have several parts with instructor assigned and instructor approved topics. Generally volcanoes and national parks are the topics assigned.
   d. Further information will be distributed with the parameters of the assignment by week 3.

5. **Discussion Question**
   a. This may or may not be used. If so, the student will be given a topic or question to research or may be asked to find a related news story related to the week's chapter topic that they find interesting in order to have a small in person/class discussion.

III. Examination Policy:

1. The reasons for which a student will be excused from taking an examination _____
   a. Hospitalization (with documented verification)
   b. Death in the immediate family (with documented verification)
   c. Personal illness or illness in immediate family - (doctor's excuse required).
2. A student who misses an examination for any reason is responsible for _____
   a. Contacting the instructor within a day of the missed absence in order to make arrangements for completing the missed material.
   b. A missed exam with an appropriate excuse will be made up during your study hours with Rita W or during your scheduled lab session.
   c. There is no makeup of the final exam. If you will not be present on the day of the final exam, arrangements must be made to take the test early.
3. No makeup opportunity will be given for absences of unscheduled quizzes.

IV. Class Attendance and Homework Make-Up Policy:

1. Class attendance is necessary to acquire the knowledge required to _____
   a. Complete the requirements for this course
   b. Attendance in this course is measured by the completion of weekly assignments and activities. Simply logging into Canvas or viewing course materials does not count as attendance.
2. Late Assignments
   a. To support consistent learning, time management, and professional responsibility, the following late-work policy applies:
      - Late submissions are accepted up to one week after the due date only.
      - Assignments submitted late will receive a 20% point deduction.
      - Assignments submitted more than one week late will not be accepted.
      - No late assessments are accepted after the last day of the term (final exam day).
      - Assignments due during finals week are final and must be submitted/completed by the posted deadline.
3. Extenuating Circumstances
   a. Students experiencing extenuating circumstances are encouraged to contact the instructor as soon as possible to discuss potential accommodations. In some cases, advance notice may be required.
   b. Approval of late or make-up work is not guaranteed and is determined at the instructor's discretion.

c. Requests that do not align with this policy may be denied.
d. This policy is supported by the Dean and Assistant Dean, who expect students to communicate promptly with their instructor when emergencies arise. This expectation reflects professional workplace standards, where timely communication is required if deadlines or responsibilities cannot be met.

4. Advance Communication
5. a. Students who anticipate difficulty meeting a deadline should contact the instructor in advance to determine whether an alternate schedule may be considered.

V. Classroom Expectations:

1. Proper clean up of your lab space prior to leaving the lab when warranted.
2. No chatting or carrying on conversation while the instructor is speaking/lecturing. If the instructor can hear you at the front of the room then others can too.
3. Participation in group activities and/or class discussions.
4. Being on time for the beginning of lecture and labs.