North Central State College

MASTER SYLLABUS	2026-2027

A. Academic Division: Liberal Arts

B. Discipline: Physical Science

C. Course Number and Title: GEOL1010 Physical Geology

D. Assistant Dean: Laura Irmer, MFA, MA

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 -920	**Course Title:**	Physical Geology
Semester / Session:	Summer 2026	**Start / End Date:**	05/26/2026 - 07/16/2026

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:	419-755-4560 (Liberal Arts Office)	**E-Mail Address:**	cerbacher@ncstatecollege.edu
Office Location:	Virtual/Online	**Office Hours:**	By Appointment

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

Weeks	Topics	Assignment	Due Date
1	• Introduction to Geology • Plate Tectonics	• Introduction to Geology Concept Questions • Plate Tectonics Concept Questions • Kola Superdeep Borehole Video & Questions • Time Traveling Video & Questions • East African Rift Video & Questions • Plate Tectonics Lab	Sunday, May 31
2	• Matter & Minerals • Igneous Rocks • Volcanoes & Volcanic Hazards	• Matter & Minerals Concept Questions • Igneous Rocks Concept Questions • Volcanoes Concept Questions • Mineral Lab • Igneous Rock Lab • Volcano Lab	Sunday, June 7
3	• Weathering and Soils • Sedimentary Rocks	• Exam 1 • Weathering & Soils Concept Questions • Sedimentary Rocks Concept Questions • Sedimentary Rock Lab	Sunday, June 14
4	• Metamorphic Rocks • Earthquakes • Origin & Evolution of the Ocean Floor	• Metamorphic Rocks & Earthquakes • Concept Questions • Ocean Floor Concept Questions • Metamorphic Rock Lab • Earthquake Lab	Sunday, June 21

Weeks	Topics	Assignment	Due Date
5	• Crustal Deformation & Mountain Building • Mass Movement	• Exam 2 • Crustal Deformation & Mountain • Building Concept Questions • Mass Movement Concept Questions	Sunday, June 28
6	• Running Water • Groundwater • Glaciers and Glacial Landscapes	• Running Water & Groundwater Concept • Questions • Glaciers & Glacial Landscapes Concept • Questions • Mass Wasting Lab • Groundwater Lab • Glacier Lab	Sunday, July 5
7	• Deserts and Wind • Shorelines • Geologic Time • Earth's Evolution	• Exam 3 • Deserts & Wind Concept Questions • Shorelines Concept Questions • Geologic Time & Earth's Evolution Concept Questions • Oceanography Lab	Sunday, July 12
8	• Global Climate Change	• Exam 4 • Global Climate Change Concept Questions • Geologic Time Lab	Thursday, July 16

NOTE: There will be some adjustment to this schedule with some lab assignments being combined with chapter concept assignments or the removal of a few labs.

II. Grading and Testing Guidelines:

Final Grade Calculation

Activity	Qty	Points	Percentage
Chapter Concept Questions	19	380-570	n/a
Labs	9-12	450-600	n/a
Tests	4	400	n/a
TOTAL POINTS		**1230-1570**	

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.

- **Chapter Concept Questions**
- Utilize the provide powerpoints, lecture notes, videos, and the textbook to find the appropriate answers.

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

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. Scheduling a time to makeup the missed exam.
   c. There is no makeup of exam 4.

IV. Class Attendance and Homework Make-Up Policy:

1. Attendance Policy:
   - There are no face-to-face attendance requirements in online sections. It is anticipated that students will be logging into the course frequently (many times each week). Your attendance in online sections will be marked each week as:
   - fully attended (submitting all assignments for the module on time)
   - partially attended (submitting some portion of assignments for the module on time)
   - absent (not submitting any assignments for a module on time)
   - Students must participate within the first week of the term in order to avoid being dropped for non-participation. This is a college-wide policy. Students must also participate in and achieve at least 67% success by the point of mid term grade reporting to again avoid being dropped from the course for non-participation (another college-wide policy).

   b. Homework Make-Up Policy:
   - Students are responsible for completing and turning assignments in prior to the due dates set in Canvas
   - Students are responsible for contacting the instructor via email or Canvas messenger with content questions or to request extensions
   - Assignment extensions are given at the instructor's discretion and point deductions up to 20% may apply
   - Only assignments submitted within one week of the due date will be considered for late grading
   - There are no late assignments accepted after the last day of the term—NO EXCEPTIONS! Any assignments listed with due dates within finals week are final!

V. Classroom Expectations:

- Online Delivery:
  - Although many students report that they learn more in online classes than in face-to-face classes and find the experience more rewarding, online classes are not right for everyone.
  - In order to decide if online learning is right for you, think about the following questions: Do you have self- discipline (i.e., responsibility to follow a weekly schedule)? Are you motivated to pace yourself and keep up with weekly assignments? Are you able to commit a certain amount of time every week to the course assignments (readings from the textbook and lecture slides, watching assigned videos, taking exams online)? If your answer to these questions is YES, then online learning is the right choice for you.
  - The true advantage/benefit of an online course is the FLEXIBILITY it provides to the student (you are the one in charge of determining the time and place for studying).