



UNIVERSITY OF NORTHERN COLORADO

Extended Campus

College of Natural & Health Sciences
Department of Earth & Atmospheric Sciences

UNC Dual Enrollment at Bennett High School

GEOL 100-684 General Geology 4 credits (LAC; gtP*)
Fall 2020

Instructor: L.M. Mangham, M.A., Earth Science
Email: Lancem@bsd29j.com
Telephone: 303.644.1511 ext 7511
Office #: BHS North Bldg Room A103
Office Hours: By Appointment
Classroom#: A103

Course Description:

Survey for nonscience majors. Origins and classification of minerals and rocks, landscape development and earth's structure and history.

Textbook:

Tarbuch, Lutgens et al., 2016, Earth: An Introduction to Physical Geology, 11th edition, Pearson Prentice Hall, p.724.

Class Schedule: Lecture/Lab: M, T, W, TH at Bennett High School, North Bldg, Rm A103.

STANDARD COMPETENCIES:

- I. Recognize and appreciate the vastness of geological time and illustrate this by example and/or metaphor.
- II. Recognize and classify the common minerals and rocks by their observable characteristics.
- III. Locate and identify geologic features using topographic and/or geologic maps.
- IV. Discuss the origin of intrusive and extrusive igneous rocks and recognize landforms associated with each.
- V. Understand the weathering processes involved in the transition from bedrock to soil and sediment.
- VI. Discuss the processes involved in the formation of sedimentary rocks and relate them to modern and ancient depositional environments.
- VII. Understand the agents and processes of metamorphism and relate these to the various metamorphic rocks.
- VIII. Analyze the causes and effects of earthquakes and relate seismology to the structure of the earth.
- IX. Describe the hydrological cycle and relate this concept to both the surface and subsurface waters.
- X. Discuss the mechanics of Earth's waters (e.g., running water, waves, tides and currents, groundwater), mass wasting, wind and glacial ice and relate these agents and processes to the origin of landforms.
- XI. Classify folds, faults, and mountains and discuss their origin.
- XII. Discuss the basic lines of evidence for continental drift, sea floor spreading, and plate tectonics.
- XIII. Discuss the characteristics of plate boundaries and heat plumes and their relationships to earthquakes, volcanic and mountain building activities.

XIV. Read, analyze and apply written material to new situations.

XV. Write and speak clearly and logically in presentations and essays.

XVI. Demonstrate the ability to select and apply contemporary forms of technology to solve problems or compile information.

Course Expectations

Your attendance to the class is very important and you need to make a determined effort to be in attendance. You are allowed 3 unexcused absences, after which your grade will begin to suffer. Tardiness will be noted and recorded. After three tardies the student will be reported to the Bennett center and may be subject to a grade reduction at the end of the semester when final grades are to be tabulated and turned in as an official report to the University of Northern Colorado.

Behavioral Expectations

There is to be none of the following: food, drink (just water), cell phones or use of headphones. You are to be respectful and courteous in class to your fellow classmates and instructor. If you have a question, please raise your hand rather than speaking out loud. Go to the Student Handbook for further clarity on policies regarding student expectations

Competencies/Student Learning Outcomes:

Inquiry & Analysis:

Select or Develop a Design Process

Select or develop elements of the methodology or theoretical framework to solve problems in a given discipline.

Analyze and Interpret Evidence

Examine evidence to identify patterns, differences, similarities, limitations, and/or implications related to the focus.

Utilize multiple representations to interpret the data.

Draw Conclusions

State a conclusion based on findings.

Quantitative Literacy:

Interpret Information

Explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words).

Represent Information

Convert information into and between various mathematical forms (e.g., equations, graphs, diagrams, tables, words).

List of Course Learning Outcomes

REQUIRED COURSE LEARNING OUTCOMES

1. Analyze sediments and identify sedimentary rocks based on their notable characteristics.
2. Reconstruct paleo-environment - including paleoclimate, paleogeography, plate setting, and agent of erosion - from the analysis of sedimentary rocks and structures.
3. Interpret modern and ancient depositional settings through the analysis of sediments, sedimentary rocks, and sedimentary structures.
4. Recognize the vastness of geologic time and apply the techniques of relative and absolute dating.
5. List the major divisions of the geologic time scale.

6. Interpret and correlate geologic events and features by means of stratigraphic analysis, including the use of geologic maps and stratigraphic sections.
7. Describe and discuss how fossils form and how they are used as indicators of relative age and ancient environments.
8. Recognize the major fossil groups.
9. Describe and discuss the theory of evolution and correlate major events in the history of life with the geologic events occurring at that time.
10. Identify the major developments in the history of geologic thought.
11. Explain Plate Tectonics Theory.
12. Describe and discuss current research on the origin and development of the Earth, geosphere, hydrosphere, and atmosphere.
13. Delineate major geologic events during the Hadean, Archean, and Proterozoic Eons and the Paleozoic, Mesozoic, and Cenozoic Eras with emphasis on what is now North America.
14. Relate Earth's features and history to the theory of Plate Tectonics.
15. Describe Earth's major mass extinctions and lines of evidence for their causes.
16. Demonstrate an understanding of how climate has changed throughout Earth's history and the evidence for these changes (e.g. stable isotopes).

Assessment

Three exams will be administered to demonstrate competency and knowledge gained of the material. The following dates for these exams are as follows:

Exam Dates

| | |
|--------------------------|---------------------|
| September 21st | First Semester Exam |
| October 26 th | Midterm |
| December 14th | Final |

Holiday Dates

| | |
|--------------------|------------------------|
| Labor Day | September 7, 2020 |
| Thanksgiving Break | November 23 – 27, 2020 |

(As necessary flexibility will be allowed to change the dates based on schedule conflicts and other unforeseen difficulties).

Course Policies:

Attendance in this class is vitally important. A tremendous amount of information can be missed with one absence. If you are going to be absent, please inform me by email so I may hold your homework, and possible notes. Excused absences are any absences involving illnesses, appointments, field trips, family leave, etc. If you need to miss more than one day within a week or successive weeks, please inform me right away so arrangements can be made. Please be on time to class each day. Tardiness due to inclement weather will be forgiven. But if you are tardy on a regular basis, it will be reported to the Bennett Center, and there will be an appropriate reduction of your grade.

Plagiarism

Plagiarism is defined by the following:

- turning in someone else's work as your own
- copying words or ideas from someone else without giving credit
- failing to put a quotation in quotation marks
- giving incorrect information about the source of a quotation
- changing words but copying the sentence structure of a source without giving credit

- copying so many words or ideas from a source that it makes up the majority of your work, whether you give credit or not (see our section on "fair use" rules)

Plagiarism will not be tolerated by any student. Appropriate action will be taken by myself, the instructor, and further, will be reported to administration officials at the University of Northern Colorado.

Grading Scale

Grades:

A = 90 or greater

B = 80-89

C = 70-79

D = 60-69

F = 59 or lower

Allocation:

| | |
|-------------------|------------|
| Exam one | 15% |
| Exam two | 15% |
| Exam three | 15% |
| Paper | 25% |
| Homework | 20% |
| <u>Laboratory</u> | <u>10%</u> |
| Total: | 100% |

Materials Needed

1 – 3 ring binder with college ruled paper

A divider to separate lecture notes from lab notes

1 – lined composition book for rock, mineral, and various other labs

1 inexpensive azimuth Compass (any sporting goods store will have these)

Material to be covered

| | |
|------------|--|
| Chapter 1 | An Introduction to Geology |
| Chapter 2 | Plate Tectonics: A Scientific Revolution Unfolds |
| Chapter 3 | Matter and Minerals |
| Chapter 4 | Igneous Rocks |
| Chapter 5 | Volcanoes |
| Chapter 6 | Weathering and Soils |
| Chapter 7 | Sedimentary Rocks |
| Chapter 8 | Metamorphic Rocks |
| Chapter 9 | Geologic Time |
| Chapter 10 | Crustal Deformation |
| Chapter 11 | Earthquakes |
| Chapter 12 | Earth's Interior |
| Chapter 15 | Mass Wasting Processes |
| Chapter 16 | Running Water |
| Chapter 18 | Glaciers and Glaciation |

Laboratory Projects

Lab Unit 1

Coordinate System of the Earth

-latitude, longitude, time zones

Topographic Mapping

-How to understand and interpret topographic lines and symbols

-How to read a 7 ½ minute series quadrangle map

Reading a compass and triangulation

-How to operate and read an azimuth compass

-Map and triangulate your own map using your compass

-Introduction to GIS: Geographic Information Systems with Arcmap 9.3

Lab Unit 2

Mineral Lab

-The identification of minerals by testing their unique diagnostic properties

Igneous Rock Lab

-Identifying various igneous rocks and their formation

Sedimentary Rock Lab

-Identifying various sedimentary rocks

-Identifying depositional environments of sedimentary rocks

Metamorphic Rock Lab

-Identifying various metamorphic rocks and their formation

Lab Unit 3

Streamtable labs – Geomorphology (the changing landscape)

–Modeling the formation of a stream through a stream table

-Meandering river systems, braided stream development and associated components, straight river systems (the special case), concept of base level

Earthquake Labs

-Seismic waves (P and S waves)

-Triangulating the epicenter

Fossils

-Identification, classification of invertebrate/vertebrate fossils

-Anatomy of invertebrates

Homework

Homework will be assigned weekly and will usually come in the form of chapter work in the back of the book. Special homework assignments will be based off of subjects that are specifically focused in areas, such as, paleontology, archaeology, climate studies, paleoenvironments, oceanographic studies, and etc. These special homework assignments will come in the form of a mix of multiple choice, fill in the blank, and essay questions.

Note: Homework not turned in on time will result in a 30% reduction in the assignment. LATE HOMEWORK WILL NOT BE ACCEPTED TWO DAYS PAST THE DEADLINE.

Research Paper

A research paper involving some aspect of physical geology will be expected by the student. Topics are the student's choice but must be cleared by the instructor before beginning. The following structure of the paper should be followed closely: (Please see the guidelines for the writing of papers).

Excellent topics to choose are geology topics having to do with Colorado!!

General format of paper

1. Title page
2. Double spaced, Times New Roman, 12-point font
3. Table of contents at the beginning that reflects major headings and subheadings used above the paragraphs
4. A 270-word introduction should be used to introduce your topic

5. Page numbers, beginning on page 1 of the Introduction page
6. In-text citations in the body of the paper to match bibliographical references
8. No more than 3- 4 figures or tables illustrating various points of your topic
9. Headings and subheadings used to demonstrate organization of the paper (headings of paper should match your table of contents #3)
10. The subject matter should end with a summary, or, conclusion near the end
11. Bibliography: A bibliography page recording a minimum of five sources in APA format.

Students with Disabilities- Any student requesting disability accommodation for this class must inform the instructor, giving appropriate notice. Students are encouraged to contact the Bennett High School counseling office to certify documentation of disability and to ensure appropriate accommodations are implemented in a timely manner.

UNC Policies

Academic Integrity

As members of a scholarly community dedicated to healthy intellectual development, students and faculty are expected to share the responsibility for maintaining high standards of honesty and integrity in their academic work. All material for this course must be your work and no one else's. Cheating or plagiarism in any form will not be tolerated. This includes, but is not limited to, copying someone else's work, and using banned material while taking exams. The penalty for cheating or plagiarism is a zero for the course.

Honor Code: all members of the University of Northern Colorado community are entrusted with the responsibility to uphold and promote five fundamental values: Honesty, Trust, Respect, Fairness, and Responsibility. These core elements foster an atmosphere, inside and outside of the classroom, which serves as a foundation and guides the UNC community's academic, professional, and personal growth. Endorsement of these core elements by students, faculty, staff, administration, and trustees strengthens the integrity and value of our academic climate.

Liberal Arts Core & Colorado gtPathways. This course satisfies 4 credits of Area 6 (Physical & Life Sciences) of the UNC Liberal Arts Core. This course has been approved by the Colorado Commission on Higher Education for inclusion in the Colorado Guaranteed Transfer Program, gtP. gtP courses automatically transfer to any public institution in Colorado and will continue to count toward general education or other graduation requirements for any liberal arts or science associate or bachelor's degree program IF a grade of C- or higher is recorded. Statewide articulation agreements prescribe specific general education and degree requirements in the following professional degree programs: business, early childhood, elementary education, engineering and nursing. Most other courses not approved for the gtP designation will also be accepted in transfer by other institutions but may not fulfill general education or degree requirements.

Dropping or Withdrawing from a UNC Dual Credit Course

Note: Drop and withdrawal dates for the courses at your school can be found on your [dual enrollment page for your high school](#) or by speaking with the high school instructor.

Please use the [Dual Enrollment Drop & Withdrawal Form](#).

- You can drop your course up until the designated Drop Deadline. The course will be removed from your transcript and you will receive a full tuition refund.
- After the Drop Deadline, and up until the Withdrawal Deadline, you can withdraw from your course. The course will remain on your transcript with a grade of "W" (this does not impact your GPA), and there is no tuition refund.
- After the withdrawal deadline, you are unable to be removed from the course. The course will remain on your transcript with the grade you have earned, and there is no tuition refund.
- If you stop attending the course but fail to officially withdraw from the course(s), you will be responsible for full tuition and fees and the course grade will remain on your transcript.