

# GEOLOGY, GEOSCIENCES (BS)

Degree: Bachelor of Science  
Major: Geosciences  
Concentration: Geology  
Program Code: 3472

## About This Major . . .

The Bachelor of Science degree with a major in Geosciences and a concentration in Geology is designed for students who (1) desire a strong liberal arts education with emphasis on the earth sciences, (2) wish to pursue a graduate degree in geology, or (3) desire a professional or technical geoscience career. Recent graduates are attending graduate programs at major universities or have entered the work force as geological technicians or professional geologists. Instruction takes place in a state-of-the-art science complex, which houses several instructional laboratories, a projects room, computer-applications laboratory, petrology-mineralogy laboratory, rock-storage facilities, and a sample preparation room. Most classes have a strong field component so that students benefit from the diverse geological setting of the Grand Junction area. Equipment includes research petrographic microscopes, binocular microscopes, x-ray diffractometer, x-ray fluorescence, GPS units, local seismic network, and a magnetometer. Computer facilities include PC systems with software for communications, database management, word-processing, geographical information systems (GIS), and geostatistics. Students engage in a capstone research project/thesis during their senior year that involves independent research and the completion of a professional report and presentation. Students develop professional skills and complete a portfolio of their work for future employers or graduate schools.

For more information on what you can do with this major, visit Career Services' What to Do with a Major? (<https://www.coloradomesa.edu/career/students/explore/major.html>) resource.

All CMU baccalaureate graduates are expected to demonstrate proficiency in specialized knowledge/applied learning, quantitative fluency, communication fluency, critical thinking, personal and social responsibility, and information literacy. In addition to these campus-wide student learning outcomes, graduates of this major will be able to:

1. Articulate the fundamental knowledge base and ideas of the major fields of geoscience. (Specialized Knowledge)
2. Collect and interpret geoscience field data. (Applied Learning/Critical Thinking)
3. Collect and interpret geoscience laboratory data. (Applied Learning/Critical Thinking)
4. Use technology (e.g. computer software) for evaluating quantitative geoscience data. (Quantitative Fluency)
5. Write an effective report on a geoscience study. (Communication Fluency)
6. Give an effective oral presentation on a geoscience study. (Communication Fluency)

## Requirements

Each section below contains details about the requirements for this program. Select a header to expand the information/requirements for that particular section of the program's requirements.

To print or save an overview of this program's information, including the program description, learning outcomes, requirements, suggested course sequencing (if applicable), and advising and graduation information, scroll to the bottom of the left-hand navigation menu and select 'Print Options.' This will give you the options to either 'Send Page to Printer' or 'Download PDF of This Page.' The 'Download PDF of This Page' option prepares a much more concise presentation of all program information. The PDF is also printable and may be preferable due to its brevity.

## Institutional Degree Requirements

The following institutional degree requirements apply to all CMU baccalaureate degrees. Specific programs may have different requirements that must be met in addition to institutional requirements.

- 120 semester hours minimum.
- Students must complete a minimum of 30 of the last 60 hours of credit at CMU, with at least 15 semester hours in major discipline courses numbered 300 or higher.
- 40 upper-division credits (an alternative credit limit applies to the Bachelor of Applied Science degree).
- 2.00 cumulative GPA or higher in all CMU coursework.
- A course may only be used to fulfill one requirement for each degree/certificate.
- No more than six semester hours of independent study courses can be used toward the degree.
- Non-traditional credit, such as advanced placement, credit by examination, credit for prior learning, cooperative education and internships, cannot exceed 30 semester credit hours for a baccalaureate degree. A maximum of 15 of the 30 credits may be for cooperative education, internships, and practica.
- Pre-collegiate courses (usually numbered below 100) cannot be used for graduation.
- Capstone exit assessment/projects (e.g., Major Field Achievement Test) requirements are identified under Program-Specific Degree Requirements.
- The Catalog Year determines which program sheet and degree requirements a student must fulfill in order to graduate. Visit with your advisor or academic department to determine which catalog year and program requirements you should follow.
- See "Requirements for Undergraduate Degrees and Certificates" in the catalog for a complete list of graduation requirements.

## Essential Learning Requirements

(31 semester hours)

See the current catalog for a list of courses that fulfill the requirements below. If a course is an Essential Learning option and a requirement for your major, you must use it to fulfill the major requirement and make a different selection for the Essential Learning requirement.

Code	Title	Semester Credit Hours
<b>English</b> <sup>1</sup>		
ENGL 111	English Composition I-GTCO1	3
ENGL 112	English Composition II-GTCO2	3
<b>Mathematics</b> <sup>1</sup>		
MATH 151	Calculus I-GT-MA1 <sup>2</sup>	3

<b>History</b>	
Select one History course	3
<b>Humanities</b>	
Select one Humanities course	3
<b>Social and Behavioral Sciences</b>	
Select one Social and Behavioral Sciences course	3
Select one Social and Behavioral Sciences course	3
<b>Fine Arts</b>	
Select one Fine Arts course	3
<b>Natural Sciences</b>	
Select one Natural Sciences course	3
Select one Natural Sciences course with a lab <sup>3</sup>	4
<b>Total Semester Credit Hours</b>	<b>31</b>

<sup>1</sup> Must receive a grade of 'C' or better and must be complete by the time the student has 60 semester hours.

<sup>2</sup> This is a 5 semester credit hour course. 3 credits apply to the Essential Learning Requirements and 2 credits apply to Foundation Courses.

<sup>3</sup> We recommend selecting one of the following sets of courses, with BIOL 105/BIOL 105L, PHYS 132/PHYS 132L, or CHEM 132/CHEM 132L as the best choices for students interested in attending graduate school: BIOL 105/BIOL 105L, PHYS 112/PHYS 112L, PHYS 132/PHYS 132L, or CHEM 132/CHEM 132L.

Of the Total Semester Credit Hours, 1 credit applies to electives and 31 credits apply to Essential Learning requirements. See footnotes for more details.

## Other Lower Division Requirements

Code	Title	Semester Credit Hours
<b>Wellness Requirement</b>		
KINE 100	Health and Wellness	1
Select one Activity course		1
<b>Essential Learning Capstone<sup>1</sup></b>		
ESSL 290	Maverick Milestone	3
ESSL 200	Essential Speech	1
<b>Total Semester Credit Hours</b>		<b>6</b>

<sup>1</sup> Essential Learning Capstone must be taken after completion of the Essential Learning English and Mathematics requirements, and when a student has earned between 45 and 75 hours.

## Foundation Courses

(15 semester hours, must earn a grade of "C" or better in each course)

Code	Title	Semester Credit Hours
CHEM 131	General Chemistry I-GTSC1	4
CHEM 131L	General Chemistry Laboratory I-GTSC1	1
Select one of the following: <sup>1</sup>		5

PHYS 111 & 111L	General Physics-GTSC1 and General Physics Laboratory-GTSC1	
PHYS 131 & 131L	Fundamental Mechanics-GTSC1 and Fundamental Mechanics Laboratory-GTSC1	
STAT 200	Probability and Statistics-GTMA1	3
MATH 151	Calculus I-GT-MA1 <sup>2</sup>	2
<b>Total Semester Credit Hours</b>		<b>15</b>

<sup>1</sup> Either PHYS 111/PHYS 111L or PHYS 131/PHYS 131L may be taken for credit, but not both.

<sup>2</sup> This is a 5 semester credit hour course. 3 credits apply to the Essential Learning Requirements and 2 credits apply to Foundation Courses.

## Program Specific Degree Requirements

(56 semester hours, must earn a grade of "C" or better in each course)

Code	Title	Semester Credit Hours
<b>Core Courses</b>		
Select one of the following sets of courses: <sup>1</sup>		4
GEOL 111 & 111L	Principles of Physical Geology-GTSC1 and Principles of Physical Geology Laboratory-GTSC1	
GEOL 113 & 113L	Field-Based Introduction to Physical Geology-GTSC1 and Field-Based Introduction to Physical Geology Laboratory-GTSC1	
GEOL 112	Principles of Historical Geology-GTSC1	3
GEOL 112L	Principles of Historical Geology Laboratory-GTSC1	1
GEOL 202	Introduction to Field Studies	3
GEOL 204	Computer Applications in Geology	3
GEOL 301	Structural Geology	3
GEOL 301L	Structural Geology Laboratory	1
GEOL 331	Crystallography and Mineralogy	3
GEOL 331L	Crystallography and Mineralogy Laboratory	1
GEOL 402	Applications of Geomorphology	3
GEOL 402L	Applications of Geomorphology Laboratory	1
GEOL 444	Sedimentology and Stratigraphy	3
GEOL 444L	Sedimentology and Stratigraphy Laboratory	1
GEOL 480	Summer Field Camp	6
GEOL 490	Seminar	3
<b>Required Geology Courses</b>		
GEOL 340	Igneous and Metamorphic Petrology	3
GEOL 340L	Igneous and Metamorphic Petrology Laboratory	1
GEOL 404	Geophysics	3
GEOL 404L	Geophysics Laboratory	1
<b>Total Semester Credit Hours</b>		<b>47</b>

Code	Title	Semester Credit Hours
<b>Restricted Electives</b>		
Select 9 semester hours of the following: <sup>2</sup>		9

GEOL 250	Environmental Geology
GEOL 325	Introduction to Engineering Geology
GEOL 351	Applied Geochemistry
GEOL 355	Basic Hydrology
GEOL 359	Survey of Energy-Related Natural Resources
GEOL 361	Survey of Mineral-Related Natural Resources
GEOL 370	Renewable Energy
GEOL 394	Natural Resources of the West
GEOL 411 & 411L	Paleontology and Paleontology Laboratory
GEOL 415 & 415L	Introduction to Ground Water and Introduction to Ground Water Laboratory
GEOL 443 & 443L	Field-Based Depositional Systems and Field-Based Depositional Systems Laboratory
GEOL 455 & 455L	River Dynamics and River Dynamics Laboratory
GEOL 497	Structured Research
GIST 332 & 332L	Introduction to Geographic Information Systems and Introduction to Geographic Information Systems Laboratory
ENVS 312 & 312L	Soil Science and Sustainability and Soil Science and Sustainability Laboratory
CHEM 132 & 132L	General Chemistry II-GTSC1 and General Chemistry Laboratory II-GTSC1
MATH 152	Calculus II
STAT 311	Statistical Methods
PHYS 112 & 112L	General Physics-GTSC1 and General Physics Laboratory-GTSC1
PHYS 132 & 132L	Electromagnetism and Optics-GTSC1 and Electromagnetism and Optics Laboratory-GTSC1
<b>Total Semester Credit Hours</b>	
	<b>9</b>

<sup>1</sup> Either GEOL 111/GEOL 111L or GEOL 113/GEOL 113L may be taken for credit, but not both.

<sup>2</sup> Either PHYS 112/PHYS 112L or PHYS 132/PHYS 132L may be taken for credit, but not both. Seven hours of Restricted and General Electives must be upper division.

## General Electives

All college level courses appearing on your final transcript, not listed above that will bring your total semester hours to 120 hours. 12 semester hours; additional hours of upper division may be needed. Seven hours of Restricted and General Electives must be upper division.

Code	Title	Semester Credit Hours
Select electives		12
<b>Total Semester Credit Hours</b>		<b>12</b>

## Suggested Course Plan

		Semester Credit Hours
<b>First Year</b>		
<b>Fall Semester</b>		
ENGL 111	English Composition I-GTC01	3
MATH 151	Calculus I-GTMA1	5
Select one of the following:		4
GEOL 111 & 111L	Principles of Physical Geology-GTSC1 and Principles of Physical Geology Laboratory-GTSC1	
GEOL 113 & 113L	Field-Based Introduction to Physical Geology-GTSC1 and Field-Based Introduction to Physical Geology Laboratory-GTSC1	
Essential Learning - Humanities		3
Semester Credit Hours		15
<b>Spring Semester</b>		
GEOL 112 & 112L	Principles of Historical Geology-GTSC1 and Principles of Historical Geology Laboratory-GTSC1	4
ENGL 112	English Composition II-GTC02	3
Essential Learning - History		3
Essential Learning - Social and Behavioral Sciences		3
KINE 100	Health and Wellness	1
Semester Credit Hours		14
<b>Second Year</b>		
<b>Fall Semester</b>		
GEOL 202	Introduction to Field Studies	3
Essential Learning - Social and Behavioral Sciences		3
CHEM 131 & 131L	General Chemistry I-GTSC1 and General Chemistry Laboratory I-GTSC1	5
Select one of the following:		5
PHYS 111 & 111L	General Physics-GTSC1 and General Physics Laboratory-GTSC1	
PHYS 131 & 131L	Fundamental Mechanics-GTSC1 and Fundamental Mechanics Laboratory-GTSC1	
Semester Credit Hours		16
<b>Spring Semester</b>		
GEOL 204	Computer Applications in Geology	3
Essential Learning - Natural Science with Lab		4
STAT 200	Probability and Statistics-GTMA1	3
ESSL 290	Maverick Milestone	3
ESSL 200	Essential Speech	1
Semester Credit Hours		14
<b>Third Year</b>		
<b>Fall Semester</b>		
Essential Learning - Natural Science		3
GEOL 301 & 301L	Structural Geology and Structural Geology Laboratory	4
GEOL 331 & 331L	Crystallography and Mineralogy and Crystallography and Mineralogy Laboratory	4
General Electives		3
Semester Credit Hours		14
<b>Spring Semester</b>		
GEOL 340 & 340L	Igneous and Metamorphic Petrology and Igneous and Metamorphic Petrology Laboratory	4
Essential Learning - Fine Arts		3
General Electives		9
Semester Credit Hours		16
<b>Fourth Year</b>		
<b>Fall Semester</b>		
GEOL 402 & 402L	Applications of Geomorphology and Applications of Geomorphology Laboratory	4
Restricted Electives		9
Semester Credit Hours		13

**Spring Semester**

GEOL 404 & 404L	Geophysics and Geophysics Laboratory	4
KINA Activity		1
GEOL 444 & 444L	Sedimentology and Stratigraphy and Sedimentology and Stratigraphy Laboratory	4
GEOL 490	Seminar	3
Semester Credit Hours		12

**Summer Semester**

GEOL 480	Summer Field Camp	6
Semester Credit Hours		6
Total Semester Credit Hours		120

## Advising and Graduation

### Advising Process and DegreeWorks

Documentation on the pages related to this program is intended for informational purposes to help determine what courses and associated requirements are needed to earn a degree. The suggested course sequencing outlines how students could finish degree requirements. Some courses are critical to complete in specific semesters, while others may be moved around. Meeting with an academic advisor is essential in planning courses and altering the suggested course sequencing. It is ultimately the student's responsibility to understand and fulfill the requirements for her/his intended degree(s).

DegreeWorks is an online degree audit tool available in MAVzone. It is the official record used by the Registrar's Office to evaluate progress towards a degree and determine eligibility for graduation. Students are responsible for reviewing their DegreeWorks audit on a regular basis and should discuss questions or concerns with their advisor or academic department head. Discrepancies in requirements should be reported to the Registrar's Office.

### Graduation Process

Students must complete the following in the first two months of the semester prior to completing their degree requirements:

- Review their DegreeWorks audit and create a plan that outlines how unmet requirements will be met in the final semester.
- Meet with their advisor and modify their plan as needed. The advisor must approve the final plan.
- Submit the "Intent to Graduate" form to the Registrar's Office to officially declare the intended graduation date and commencement ceremony plans.
- Register for all needed courses and complete all requirements for each degree sought.

Submission deadlines and commencement details can be found at <http://www.coloradomesa.edu/registrar/graduation.html>.

If a student's petition for graduation is denied, it will be her/his responsibility to consult the Registrar's Office regarding next steps.