GEOLOGY, GEOSCIENCES (BS)

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

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? 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. Complete a comprehensive assessment exam that draws on current research, scholarship and/or techniques, as well as specialized geology knowledge at both the beginner and advanced levels. (Specialized Knowledge/Applied Learning)
2. Analyze data critically, reason logically, and apply quantitative analysis methods correctly to geological data to develop appropriate conclusions. (Quantitative Fluency)
3. Make and defend assertions about geological hypotheses in an extended well-organized document and an oral presentation. (Communication Fluency)
4. Describe reasoned conclusions that articulate the implications and consequences for a particular decision by synthesizing geological information and geology methodologies. (Critical Thinking)
5. Reflect on and respond to ethical and environmental challenges at local, national, and/or global levels. (Personal and Social Responsibility)
6. Find relevant sources of geological information, evaluate information critically, and apply the information appropriately and effectively to geologic problems. (Information Literacy)

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
English [1]		
ENGL 111	English Composition I-GTCO1	3
ENGL 112	English Composition II-GTCO2	3
Mathematics [1]		
MATH 151	Calculus I-GTMA1 [2]	3
History		
Select one History course		3
Humanities		
Select one Humanities course		3
Social and Behavioral Sciences		
Select one Social and Behavioral Sciences course		3
Select one Social and Behavioral Sciences course		3
Fine Arts		
Select one Fine Arts course		3
Natural Sciences		
Select one Natural Sciences course		3
Select one Natural Sciences course with a lab [3]		4
Total Semester Credit Hours		**31**

1 Must receive a grade of "C" or better and must be complete by the time the student has 60 semester hours.

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

3 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.

Other Lower Division Requirements

Code	Title	Semester Credit Hours
Wellness Requirement		
KINE 100	Health and Wellness	1
Select one Activity course		1
Essential Learning Capstone [1]		
ESSL 290	Maverick Milestone	3
ESSL 200	Essential Speech	1
Total Semester Credit Hours		**6**

1 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

(23 semester hours, must earn a grade of “C” or better in each course)

Code	Title	Semester Credit Hours
You must take one of the following course sequences: [1]		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 & 112L	Principles of Historical Geology-GTSC1 and Principles of Historical Geology Laboratory-GTSC1 (and)	4
CHEM 131 & 131L	General Chemistry I-GTSC1 and General Chemistry Laboratory I-GTSC1	5
You must take one of the following course sequences: [2]		5
PHYS 111 & 111L	General Physics I-GTSC1 and General Physics I Laboratory-GTSC1	
PHYS 131 & 131L	Fundamental Mechanics-GTSC1 and Fundamental Mechanics Laboratory-GTSC1	
STAT 200	Probability and Statistics-GTMA1	3
MATH 151	Calculus I-GTMA1 [3]	2
Total Semester Credit Hours		**23**

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

2 Either PHYS 111/PHYS 111L or PHYS 131/PHYS 131L may be taken for credit, but not both.

3 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

(48 semester hours, must earn a grade of “C” or better in each course)

Code	Title	Semester Credit Hours
Core Courses		
GEOL 202	Introduction to Field Studies	3
GEOL 204	Computer Applications in Geology	3
GEOL 301 & 301L	Structural Geology and Structural Geology Laboratory	4
GEOL 331 & 331L	Crystallography and Mineralogy and Crystallography and Mineralogy Laboratory	4
GEOL 402 & 402L	Applications of Geomorphology and Applications of Geomorphology Laboratory	4
GEOL 444 & 444L	Sedimentology and Stratigraphy and Sedimentology and Stratigraphy Laboratory	4
GEOL 480	Summer Field Camp	6
GEOL 490	Seminar	3
Required Geology Courses		
GEOL 340 & 340L	Igneous and Metamorphic Petrology and Igneous and Metamorphic Petrology Laboratory	4

GEOL 404 & 404L	Geophysics and Geophysics Laboratory	4
Total Semester Credit Hours		**39**

Code	Title	Semester Credit Hours
Restricted Electives		
Select 9 semester hours of the following: [1]		9
GEOL 325	Introduction to Engineering Geology	
GEOL 351	Applied Geochemistry	
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 414 & 414L	Hydrology and River Dynamics and Hydrology and River Dynamics 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 463	Subsurface Methods	
GEOL 465	Climate Change Science	
GEOL 470	Drone Explorations on Earth	
GEOL 496	Topics	
GEOL 496L	Topics Lab	
GEOL 497	Structured Research	
CHEM 132 & 132L	General Chemistry II-GTSC1 and General Chemistry Laboratory II-GTSC1	
MATH 152	Calculus II	
STAT 301	Computational Statistics	
PHYS 112 & 112L	General Physics II-GTSC1 and General Physics II Laboratory-GTSC1 [2]	
PHYS 132 & 132L	Electromagnetism and Optics-GTSC1 and Electromagnetism and Optics Laboratory-GTSC1 [2]	
Total Semester Credit Hours		**9**

[1] Seven hours of Restricted and General Electives must be upper division.

[2] Either PHYS 112/PHYS 112L or PHYS 132/PHYS 132L may be taken for credit, but not both.

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
Total Semester Credit Hours		**12**

Suggested Course Plan

First Year

Fall Semester		**Semester Credit Hours**
ENGL 111	English Composition I-GTCO1	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**
Spring Semester		
GEOL 112 & 112L	Principles of Historical Geology-GTSC1 and Principles of Historical Geology Laboratory-GTSC1	4
ENGL 112	English Composition II-GTCO2	3
Essential Learning - History		3
Essential Learning - Social and Behavioral Sciences		3
KINE 100	Health and Wellness	1
	Semester Credit Hours	**14**

Second Year

Fall Semester		
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 I-GTSC1 and General Physics I Laboratory-GTSC1	
PHYS 131 & 131L	Fundamental Mechanics-GTSC1 and Fundamental Mechanics Laboratory-GTSC1	
	Semester Credit Hours	**16**
Spring Semester		
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**

Third Year

Fall Semester		
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**
Spring Semester		
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**
Fourth Year		
Fall Semester		
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 their 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 their responsibility to consult the Registrar's Office regarding next steps.