

# MAJOR IN GEOLOGY, GEOLOGY CONCENTRATION

The Geology concentration provides a comprehensive undergraduate education in geoscience, emphasizing a hands-on and field-oriented approach that is well-suited to professional careers in the energy, water, environmental and resources industries, and the many other fields that employ geologists. The Geology concentration provides a strong general

science background for additional diverse careers, including primary and secondary school teaching, science writing, environmental and resource law, and resource and/or hazards specializations within the construction, insurance, land use, securities, and other industries. The Geology concentration additionally provides foundational preparation for graduate education in the many geosciences subdisciplines.

## Requirements Effective Fall 2024

### Freshman

		AUCC	Credits
CHEM 111	General Chemistry I (GT-SC2)	3A	4
CHEM 112	General Chemistry Lab I (GT-SC1)	3A	1
CO 150	College Composition (GT-CO2)	1A	3
GEOL 150 <sup>1</sup>	Dynamic Earth (GT-SC2)	3A	4
GEOL 154	Historical and Analytical Geology		4
GEOL 192	New Student Seminar--Exploring Geosciences		1
MATH 160 <sup>2</sup>	Calculus for Physical Scientists I (GT-MA1)	1B	4
Diversity, Equity, and Inclusion ( <a href="http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#diversity-equity-inclusion">http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#diversity-equity-inclusion</a> )		1C	3
Social and Behavioral Sciences ( <a href="http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#social-behavioural-sciences">http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#social-behavioural-sciences</a> )		3C	3
Electives			3
<b>Total Credits</b>			<b>30</b>

### Sophomore

CHEM 113	General Chemistry II		3
CHEM 114	General Chemistry Lab II		1
GEOL 232	Mineralogy		3
GEOL 250	The Solid Earth		3
GEOL 332	Optical Mineralogy		2
GEOL 364	Igneous and Metamorphic Petrology	4B	4
MATH 161 <sup>3</sup>	Calculus for Physical Scientists II (GT-MA1)	1B	4
Select one course from the following:			3
CO 300	Writing Arguments (GT-CO3)	2	
CO 301B	Writing in the Disciplines: Sciences (GT-CO3)	2	
JTC 300	Strategic Writing and Communication (GT-CO3)	2	
Select one course from the following:			5
PH 121	General Physics I (GT-SC1)	3A	
PH 141	Physics for Scientists and Engineers I (GT-SC1)	3A	
Historical Perspectives ( <a href="http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives">http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives</a> )		3D	3
<b>Total Credits</b>			<b>31</b>

### Junior

GEOL 344	Stratigraphy and Sedimentology	4A	4
GEOL 372	Structural Geology	4B	4
GEOL 376	Geologic Field Methods	4A,4C	3
NR 319	Introduction to Geospatial Science		4
Select one course from the following:			5
PH 122	General Physics II (GT-SC1)	3A	
PH 142	Physics for Scientists and Engineers II (GT-SC1)	3A	

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Select one course from the following: 3-4

- MATH 340 Intro to Ordinary Differential Equations
- STAT 301 Introduction to Applied Statistical Methods
- STAT 315 Intro to Theory and Practice of Statistics

Arts and Humanities (<http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities>) 3B 3

**Total Credits 26-27**

**Summer**

GEOL 436 Geology Summer Field Course 4C 6

**Total Credits 6**

**Senior**

GEOL 366 Sedimentary Petrology and Geochemistry 4A,4B 4

GEOL 454 Geomorphology 4

Select 3 credits from Technical Elective Department List 3

- ATS 440/GES 440 Sea Level Rise and a Sustainable Future
- CHEM 245 Fundamentals of Organic Chemistry
- CHEM 261 Fundamentals of Inorganic Chemistry
- CHEM 335 Introduction to Analytical Chemistry
- CHEM 341 Modern Organic Chemistry I
- CHEM 473 Foundations of Physical Chemistry
- CHEM 474 Physical Chemistry I
- CIVE 322 Basic Hydrology
- CIVE 440 Nonpoint Source Pollution
- CIVE 529 Environmental Organic Chemistry
- DSCI 335 Inferential Reasoning in Data Analysis
- GR 323/NR 323 Remote Sensing and Image Interpretation**
- MATH 261 Calculus for Physical Scientists III
- MATH 340 Intro to Ordinary Differential Equations
- MATH 369 Linear Algebra I
- NR 300 Biological Diversity
- NR 400 Public Communication in Natural Resources
- NR 422 GIS Applications in Natural Resource Management
- NR 426 Programming for GIS I
- NR 427 Programming for GIS II
- NR 450 Geospatial Project Design and Analysis
- NR 453 Geospatial Field Methods in Natural Resources
- NR 503/GR 503 Remote Sensing and Image Analysis
- PH 314 Introduction to Modern Physics
- PH 361 Physical Thermodynamics
- SOCR 440 Pedology
- SOCR 455 Microbiomes of Soil Systems
- SOCR 470 Soil Physics
- STAT 315<sup>4</sup> Intro to Theory and Practice of Statistics
- WR 406 Seasonal Snow Environments
- WR 416 Land Use Hydrology
- WR 418 Land Use and Water Quality

Geology Electives<sup>5</sup> 7

Arts and Humanities (<http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities>) 3B 3

Electives <sup>6</sup>	5-6
<b>Total Credits</b>	<b>26-27</b>
<b>Program Total Credits:</b>	<b>120</b>

<sup>1</sup> GEOL 110, GEOL 120, GEOL 122 or GEOL 124 in combination with GEOL 121 may be substituted for GEOL 150.

<sup>2</sup> MATH 155 may be substituted for MATH 160.

<sup>3</sup> Students who substituted MATH 155 for MATH 160 should substitute MATH 255 for MATH 161.

<sup>4</sup> STAT 315 can be used to fulfill technical elective requirement if not taken for statistics requirement in junior year.

<sup>5</sup> Select at least two upper-division regular or experimental GEOL courses (300-381, 402-481, 500-581) for a minimum of five

credits. A maximum of two credits may be satisfied by non-regular courses (courses ending in -82 to -99) and GEOL 401, which may only count once.

<sup>6</sup> Select enough elective credits to bring the program total to a minimum of 120 credits, of which at least 42 must be upper-division (300- to 400-level).

## Major Completion Map

### Freshman

Semester 1		Critical	Recommended	AUCC	Credits
CO 150	College Composition (GT-CO2)	X		1A	3
GEOL 150	Dynamic Earth (GT-SC2)	X		3A	4
GEOL 192	New Student Seminar--Exploring Geosciences	X			1
Social and Behavioral Sciences ( <a href="http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#social-behavioural-sciences">http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#social-behavioural-sciences</a> )			X	3C	3
Electives			X		3
<b>Total Credits</b>					<b>14</b>

Semester 2		Critical	Recommended	AUCC	Credits
CHEM 111	General Chemistry I (GT-SC2)	X		3A	4
CHEM 112	General Chemistry Lab I (GT-SC1)	X		3A	1
GEOL 154	Historical and Analytical Geology	X			4
MATH 160	Calculus for Physical Scientists I (GT-MA1)	X		1B	4
Diversity, Equity, and Inclusion ( <a href="http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#diversity-equity-inclusion">http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#diversity-equity-inclusion</a> )		X		1C	3
CO 150 and MATH 126 must be completed by the end of Semester 2.					
<b>Total Credits</b>					<b>16</b>

### Sophomore

Semester 3		Critical	Recommended	AUCC	Credits
CHEM 113	General Chemistry II	X			3
CHEM 114	General Chemistry Lab II	X			1
GEOL 232	Mineralogy	X			3
GEOL 332	Optical Mineralogy	X			2
Select one course from the following:		X			5
PH 121	General Physics I (GT-SC1)			3A	
PH 141	Physics for Scientists and Engineers I (GT-SC1)			3A	
Historical Perspectives ( <a href="http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives">http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives</a> )			X	3D	3
<b>Total Credits</b>					<b>17</b>

Semester 4		Critical	Recommended	AUCC	Credits
GEOL 250	The Solid Earth	X			3
GEOL 364	Igneous and Metamorphic Petrology	X		4B	4
MATH 161	Calculus for Physical Scientists II (GT-MA1)	X		1B	4
Select one course from the following:		X			3
CO 300	Writing Arguments (GT-CO3)			2	
CO 301B	Writing in the Disciplines: Sciences (GT-CO3)			2	
JTC 300	Strategic Writing and Communication (GT-CO3)			2	
<b>Total Credits</b>					<b>14</b>

<i>Junior</i>					
<b>Semester 5</b>		<b>Critical</b>	<b>Recommended</b>	<b>AUCC</b>	<b>Credits</b>
GEOL 344	Stratigraphy and Sedimentology	X		4A	4
Select one course from the following:		X			5
PH 122	General Physics II (GT-SC1)			3A	
PH 142	Physics for Scientists and Engineers II (GT-SC1)			3A	
Select one course from the following:		X			3-4
MATH 340	Intro to Ordinary Differential Equations				
STAT 301	Introduction to Applied Statistical Methods				
STAT 315	Intro to Theory and Practice of Statistics				
<b>Total Credits</b>					<b>12-13</b>
<b>Semester 6</b>		<b>Critical</b>	<b>Recommended</b>	<b>AUCC</b>	<b>Credits</b>
GEOL 372	Structural Geology	X		4B	4
GEOL 376	Geologic Field Methods	X		4A,4C	3
NR 319	Introduction to Geospatial Science	X			4
Arts and Humanities ( <a href="http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-and-humanities">http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-and-humanities</a> )			X	3B	3
CHEM 113 must be completed by the end of Semester 6.		X			
<b>Total Credits</b>					<b>14</b>
<b>Semester 7</b>		<b>Critical</b>	<b>Recommended</b>	<b>AUCC</b>	<b>Credits</b>
GEOL 436	Geology Summer Field Course	X		4C	6
<b>Total Credits</b>					<b>6</b>
<i>Senior</i>					
<b>Semester 8</b>		<b>Critical</b>	<b>Recommended</b>	<b>AUCC</b>	<b>Credits</b>
GEOL 366	Sedimentary Petrology and Geochemistry	X		4A,4B	4
Technical Elective (See Department List on Concentration Requirements tab)		X			3
Geology Elective		X			3
Arts and Humanities ( <a href="http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities">http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities</a> )			X	3B	3
STAT 301 or STAT 315 or MATH 340 must be completed by the end of Semester 8.		X			
<b>Total Credits</b>					<b>13</b>
<b>Semester 9</b>		<b>Critical</b>	<b>Recommended</b>	<b>AUCC</b>	<b>Credits</b>
GEOL 454	Geomorphology	X			4
Geology Elective		X			4
Electives		X			5-6
The benchmark courses for the 9th semester are the remaining courses in the entire program of study.		X			
<b>Total Credits</b>					<b>13-14</b>
<b>Program Total Credits:</b>					<b>120</b>