

MAJOR IN GEOLOGY, GEOPHYSICS CONCENTRATION

The Geophysics concentration combines a strong foundation in geology with additional depth in geophysics, physics, mathematics, associated quantitative data analysis, and computer skills. The concentration

provides strong preparation for employment in a wide variety of public- and private-sector geosciences, resources, national defense, and geotechnical careers, and for graduate education in geophysics, seismology, geodynamics, energy, water, environmental science, space science, and many other disciplines.

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 ¹	Dynamic Earth (GT-SC2)	3A	4
GEOL 154	Historical and Analytical Geology		4
GEOL 192	New Student Seminar--Exploring Geosciences		1
MATH 160	Calculus for Physical Scientists I (GT-MA1)	1B	4
1C (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#aucc)		1C	3
Social and Behavioral Sciences (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#social-behavioral-sciences)		3C	3
Electives			3
Total Credits			30

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 364	Igneous and Metamorphic Petrology	4B	4
MATH 151	Mathematical Algorithms in Matlab I		1
MATH 161	Calculus for Physical Scientists II (GT-MA1)	1B	4
MATH 261	Calculus for Physical Scientists III		4
PH 141	Physics for Scientists and Engineers I (GT-SC1)	3A	5
Historical Perspectives (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives)		3D	3
Total Credits			31

Junior

GEOL 344	Stratigraphy and Sedimentology	4A	4
GEOL 372	Structural Geology	4B	4
GEOL 376	Geologic Field Methods	4A,4C	3
MATH 340	Intro to Ordinary Differential Equations		4
PH 142	Physics for Scientists and Engineers II (GT-SC1)	3A	5
Select one course from the following:			3
MATH 369	Linear Algebra I		
STAT 301	Introduction to Applied Statistical Methods		
STAT 315	Intro to Theory and Practice of Statistics		
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	

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

Total Credits **29**

Summer

GEOL 436 Geology Summer Field Course 4C 6

Total Credits **6**

Senior

Directed Technical Electives (select a minimum of 12 credits - see list below): 12-14

Upper-Division Geology Electives² 3-5

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

Electives³ 2-6

Total Credits **24**

Program Total Credits: **120**

Directed Technical Electives List (Select a minimum of 12 credits)

Code	Title	Credits
GEOL 440	Geodetic and Near-Surface Geophysical Methods	4
GEOL 442	Applied Geophysics	4
GEOL 452	Hydrogeology	4
GEOL 540	Petrophysics and Well Log Interpretation	3
GEOL 541	Geostatistics	2
GEOL 570	Plate Tectonics	3
GEOL 574	Geodynamics	3
GEOL 578	Global Seismology	4
GEOL 579	Solid Earth Inverse Methods and Practices	3
MATH 317	Advanced Calculus of One Variable	3
MATH 332	Partial Differential Equations	3
MATH 417	Advanced Calculus I	3
MATH 418	Advanced Calculus II	3
MATH 419	Introduction to Complex Variables	3
MATH 450	Introduction to Numerical Analysis I	3
MATH 469	Linear Algebra II	3
MATH 530	Mathematics for Scientists and Engineers	3

PH 245	Introduction to Electronics	3
PH 314	Introduction to Modern Physics	4
PH 341	Mechanics	4
PH 351	Electricity and Magnetism	4
PH 353	Optics and Waves	4
PH 361	Physical Thermodynamics	3
One option may be selected from the following if not used to satisfy Junior year program requirements:		3
MATH 369	Linear Algebra I	
STAT 301	Introduction to Applied Statistical Methods	
or STAT 315	Intro to Theory and Practice of Statistics	

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

² Select 3 to 5 credits in 300- to 500-level GEOL courses excluding GEOL 384, GEOL 401, GEOL 492, GEOL 494A-I.

³ 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
CHEM 111	General Chemistry I (GT-SC2)	X		3A	4
CHEM 112	General Chemistry Lab I (GT-SC1)	X		3A	1
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 (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#social-behavioural-sciences)			X	3C	3

Total Credits **16**

Semester 2		Critical	Recommended	AUCC	Credits
GEOL 154	Historical and Analytical Geology	X			4
MATH 160	Calculus for Physical Scientists I (GT-MA1)	X		1B	4
1C (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#aucc)		X		1C	3

Electives			X		3
CO 150 and AUCC 1B must be completed by the end of Semester 2.		X			

Total Credits **14**

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
MATH 161	Calculus for Physical Scientists II (GT-MA1)	X		1B	4
PH 141	Physics for Scientists and Engineers I (GT-SC1)	X		3A	5

Total Credits **16**

Semester 4		Critical	Recommended	AUCC	Credits
GEOL 250	The Solid Earth	X			3
GEOL 364	Igneous and Metamorphic Petrology	X		4B	4
MATH 151	Mathematical Algorithms in Matlab I	X			1
MATH 261	Calculus for Physical Scientists III	X			4
Historical Perspectives (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives)			X	3D	3
CHEM 113 must be completed by the end of Semester 4.		X			

Total Credits **15**

Junior

Semester 5		Critical	Recommended	AUCC	Credits
GEOL 344	Stratigraphy and Sedimentology	X		4A	4
PH 142	Physics for Scientists and Engineers II (GT-SC1)	X		3A	5
Select one course from the following:		X			3
MATH 369	Linear Algebra I				
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)			X	3B	3
MATH 261 must be completed by the end of Semester 5.		X			

Total Credits **15**

Semester 6		Critical	Recommended	AUCC	Credits
GEOL 372	Structural Geology	X		4B	4
GEOL 376	Geologic Field Methods	X		4A,4C	3
MATH 340	Intro to Ordinary Differential Equations	X			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	

Total Credits **14**

Semester 7		Critical	Recommended	AUCC	Credits
GEOL 436	Geology Summer Field Course	X		4C	6

Total Credits **6**

Senior

Semester 8		Critical	Recommended	AUCC	Credits
Directed Technical Electives (See Department List on Concentration Requirements tab)		X			8
Electives			X		2-6
STAT 301, STAT 315, or MATH 369 must be completed by the end of Semester 8.		X			

Total Credits **10-14**

Semester 9	Critical	Recommended	AUCC	Credits
Directed Technical Electives (See Department List on Concentration Requirements tab)	X			4-6
Upper-Division Geology Elective	X			3-5
Arts and Humanities (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities)			3B	3
The benchmark courses for the 9th semester are the remaining courses in the entire program of study.	X			
Total Credits				10-14
Program Total Credits:				120