GEOGRAPHY - BACHELOR OF SCIENCE (BS)

The Bachelor of Science in Geography is a degree program that focuses on the interdisciplinary study of the spatial and temporal distribution and interrelationships of people, natural resources, and plant and animal life.

The curriculum offers two tracks, Geographic Information Science and Physical Geography; it also includes offerings in historical and political geography, cultural geography, environmental geography, economic geography, regional science and urban geography.

Applications of the skills and methods learned in the BS in Geography degree program encompass a wide variety of areas such as land-use planning, conservation, modeling, development studies, and studies of various countries, regions and resources.

Requirements

General Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses below.

For the bachelor of science degree students must complete a concentration in either geographic information science or physical geography. The coursework for these two transcripted concentrations is listed below.

Students must complete at least 39 and no more than 66 credit hours towards the major area with grades of C- or better (22 credit hours must be upper-division). No pass/fail grades are allowed in the major. Students must have a grade point average of at least 2.000 in the major in order to graduate.

Transfer students majoring in geography must complete at least 12 credit hours of upper-division geography courses at CU Boulder. No course may be used to fulfill more than one requirement for the major.

Required Courses and Credit Hours

Physical Geography Concentration

Complete the following GEOG coursework as well as the **ancillary mathematics and science coursework**.

Code	Title	Credit Hours
Required GEOG Coursework		
GEOG 1101 & GEOG 1106	Our Changing Planet: Climate and Vegetation and Our Changing Planet: Climate and Vegetation Lab	4
GEOG 1111 & GEOG 1116	Our Changing Planet: Landscapes and Water and Our Changing Planet: Landscapes and Water Lab	4
Select one of the following human geography courses:		3-4
GEOG 1972 & GEOG 1976	Sustainable Futures, Environment and Society and Sustainable Futures, Environment and Society Lab	
GEOG 1992	Human Geographies	
GEOG 2092	Advanced Introduction to Human Geography	
Statistics Requirement		
GEOG 3023	Statistics and Geographic Data	4
Select one of the following mapping courses:		3-4
GEOG 2053	Mapping Our World	
GEOG 3153 & GEOG 3156	Geographic Information Science: Mapping and Geographic Information Science: Mapping Lab	
Select at least one of the following methods courses:		3-4
GEOG 4023	Advanced Quantitative Methods for Spatial Data	
GEOG 4043	Advanced Geovisualization and Web Mapping	
GEOG 4093	Remote Sensing of the Environment	
GEOG 4173	Research Seminar	
GEOG 4722	Field Methods in Human Geography	
GEOG 4103	Geographic Information Science: Spatial Analytics	
Physical Geography Concentration Courses		
Select at least two of the following:		6-8
GEOG 3351	Biogeography	
GEOG 3611 & GEOG 3616	The Water Cycle and The Water Cycle Lab	
GEOG 3601	Principles of Climate	
GEOG 4241	Earth Surface Processes	
Select at least two of the following electives:		6-8
GEOG 3251	Mountain Geosystems	
GEOG 3301	Analysis of Climate and Weather Observations	
GEOG 3351	Biogeography	
GEOG 3611 & GEOG 3616	The Water Cycle and The Water Cycle Lab	
GEOG 3601	Principles of Climate	
GEOG 4001	Topics in Physical Geography [1]	
GEOG 4173	Research Seminar (may be applied to the concentration on a case-by-case basis)	
GEOG 4201	Biometeorology	
GEOG 4241	Earth Surface Processes	
GEOG 4251	River Processes and Forms: Fluvial Geomorphology	
GEOG 4271	The Arctic Climate System	
GEOG 4321	Snow Hydrology	
GEOG 4371	Forest Geography: Principles and Dynamics	
GEOG 4401	Soils Geography	
GEOG 3930	Internship (may be applied to the concentration on a case-by-case basis)	
GEOG 4990	Senior Thesis (may be applied to the concentration on a case-by-case basis)	

Take additional lower-division or upper-division GEOG courses to reach 22 overall and 39 upper-division GEOG credits. (If necessary)		6-0
Total Credit Hours		**39-40**

Code	Title	Credit Hours
Ancillary Mathematics & Natural Sciences Coursework		
Select one of the following two-semester sequences in calculus:		8-10
MATH 1300 & MATH 2300	Calculus 1 and Calculus 2	
APPM 1350 & APPM 1360	Calculus 1 for Engineers and Calculus 2 for Engineers	
Select three of the following semesters of physics and chemistry, including related labs:		14-15
PHYS 1110	General Physics 1	
PHYS 1120 & PHYS 1140	General Physics 2 and Experimental Physics 1	
CHEM 1113 & CHEM 1114	General Chemistry 1 and Laboratory in General Chemistry 1	
CHEM 1133 & CHEM 1134	General Chemistry 2 and Laboratory in General Chemistry 2	
Total Credit Hours		**22-25**

[1] Special topics courses may be used to satisfy upper-division concentration requirements with approval from the department.

Geographic Information Science Concentration

Complete the following GEOG coursework as well as the **ancillary mathematics, computing, or GIS coursework**.

Code	Title	Credit Hours
GEOG 1101 & GEOG 1106	Our Changing Planet: Climate and Vegetation and Our Changing Planet: Climate and Vegetation Lab	4
GEOG 1111 & GEOG 1116	Our Changing Planet: Landscapes and Water and Our Changing Planet: Landscapes and Water Lab	4
Select one of the following human geography courses:		3-4
GEOG 1972 & GEOG 1976	Sustainable Futures, Environment and Society and Sustainable Futures, Environment and Society Lab	
GEOG 1992	Human Geographies	
GEOG 2092	Advanced Introduction to Human Geography	
Statistics Requirement		4
GEOG 3023	Statistics and Geographic Data	
Select one of the following mapping courses:		3-4
GEOG 2053	Mapping Our World	
GEOG 3153 & GEOG 3156	Geographic Information Science: Mapping and Geographic Information Science: Mapping Lab	
Select at least one of the following methods courses:		3-4
GEOG 4023	Advanced Quantitative Methods for Spatial Data	
GEOG 4043	Advanced Geovisualization and Web Mapping	
GEOG 4093	Remote Sensing of the Environment	
GEOG 4173	Research Seminar	
GEOG 4722	Field Methods in Human Geography	
Geographic Information Science Concentration		
GEOG 4123 & GEOG 4126	Geographic Information Science: Spatial Analytics and Geographic Information Science: Spatial Analytics Lab [1]	4
Upper Division GIS Geography Electives		12
GEOG 4003	Topics in Geographic Skills (Only certain topics apply)	
GEOG 4043	Advanced Geovisualization and Web Mapping	
GEOG 4093	Remote Sensing of the Environment	
GEOG 4203	Geographic Information Science: Spatial Modeling	
GEOG 4303	Geographic Information Science: Spatial Programming	
GEOG 4403	Geographic Information Science: Space Time Analytics	
GEOG 4503	Geographic Information Science: Project Management	
GEOG 4173	Research Seminar (may be applied to the concentration on a case-by-case basis)	
GEOG 3930	Internship (may be applied to the concentration on a case-by-case basis)	
GEOG 4990	Senior Thesis (may be applied to the concentration on a case-by-case basis)	
Take additional lower-division or upper-division GEOG courses to reach 39 overall and 22 upper-division GEOG credits.		2-3
Total Credit Hours		**39-43**

[1] Does not count as a methods course for students pursuing the GIS concentration.

Code	Title	Credit Hours
Ancillary Mathematics, Computing, or GIS Requirements		
Take at least 15 credits from the following Mathematics, Computing, or GIS courses.		15
INFO 1701	Programming for Information Science 1	
INFO 2201	Programming for Information Science 2	
CSCI 1300	Computer Science 1: Starting Computing	
CSCI 2270	Computer Science 2: Data Structures	
MATH 1300	Calculus 1	
or APPM 1350	Calculus 1 for Engineers	
MATH 2300	Calculus 2	
or APPM 1360	Calculus 2 for Engineers	
INFO 2301	Quantitative Reasoning for Information Science	
PSCI 2075	Quantitative Research Methods	

EBIO 4410	Biological Statistics	
STAT 2600	Introduction to Data Science	
Any GEOG course ending in -3 not used for another requirement		
Total Credit Hours		**15**

Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee: it is not a requirement for the major. To maintain adequate progress in geography, students should meet the following requirements:

- By the end of the third semester, complete GEOG 1101, GEOG 1111 and one of the following: GEOG 1962, GEOG 1972, GEOG 1982, GEOG 1992 or GEOG 2092.
- By the end of the sixth semester, complete an approved upper-division human geography course and 9 credit hours of upper-division geography courses.
- By the end of the sixth semester, complete the mapping requirement and GEOG 3023.
- By the eighth semester, complete the remaining upper-division credit hours.

Recommended Four-Year Plan of Study

Through the required coursework for the BS, students will complete all 12 credit hours of the Natural Sciences area of the Gen Ed Distribution Requirement, including the lab component and at least 6 credits hours of the Social Sciences area of this requirement.

Depending on which track students follow and which elective courses they select within the track of the BS, students can potentially complete all of the Social Sciences area and 3 credits in the Arts and Humanities area of the Gen Ed Distribution Requirement and, potentially, the Global Perspective and United States Perspective components of the Gen Ed Diversity Requirement.

Physical Geography Concentration Plan

First Year

Fall Semester		**Credit Hours**
GEOG 1101 & GEOG 1106	Our Changing Planet: Climate and Vegetation and Our Changing Planet: Climate and Vegetation Lab	4
Gen. Ed. Skills course (example: Lower-division Written Communication)		3
Gen. Ed. Distribution/Diversity course (example: Arts & Humanities/US Perspective)		3
Gen. Ed. Distribution/Diversity course (example: Global Perspective)		3
Elective		3
	Credit Hours	**16**
Spring Semester		
GEOG 1111 & GEOG 1116	Our Changing Planet: Landscapes and Water and Our Changing Planet: Landscapes and Water Lab	4
MATH 1300 or APPM 1350	Calculus 1 or Calculus 1 for Engineers	4-5
Gen. Ed. Distribution (example: Arts & Humanities)		3
Elective		3
	Credit Hours	**14-15**

Second Year

Fall Semester		
GEOG 1972 & GEOG 1976	Sustainable Futures, Environment and Society and Sustainable Futures, Environment and Society Lab (or GEOG 1992 or GEOG 2092)	3-4
MATH 2300 or APPM 1360	Calculus 2 or Calculus 2 for Engineers	4-5
Gen. Ed. Distribution course (example: Arts & Humanities)		3
Gen. Ed. Distribution course (example: Social Sciences)		3
Elective		3
	Credit Hours	**16-18**
Spring Semester		
GEOG 3153 & GEOG 3156	Geographic Information Science: Mapping and Geographic Information Science: Mapping Lab	4
GEOG Upper-Division Elective		3
PHYS 1110	General Physics 1	4
Gen. Ed. Distribution course (example: Arts & Humanities)		3
	Credit Hours	**14**

Third Year

Fall Semester		
GEOG 3023	Statistics and Geographic Data	4
Physical Geography Concentration Elective		3
CHEM 1113 & CHEM 1114	General Chemistry 1 and Laboratory in General Chemistry 1	5
Gen. Ed. Skills course (example: Upper-division Written Communication)		3
	Credit Hours	**15**
Spring Semester		
GEOG Methods course (Upper-division)		3-4
CHEM 1133 & CHEM 1134	General Chemistry 2 and Laboratory in General Chemistry 2	5
OR PHYS 1120 & PHYS 1140		
Upper-division Elective		4
Elective		3
	Credit Hours	**15-16**

Fourth Year

Fall Semester		
GEOG 3351 or GEOG 3611 or GEOG 3601 or GEOG 4241	Biogeography or The Water Cycle or Principles of Climate or Earth Surface Processes	3-4
Physical Geography Concentration Elective		3-4
Upper-division Elective		3
Upper-division Elective		3

Elective		3
	Credit Hours	**15-17**
Spring Semester		
GEOG 4241 or GEOG 3351 or GEOG 3601 or GEOG 3611	Earth Surface Processes or Biogeography or Principles of Climate or The Water Cycle	3-4
GEOG Elective (Upper-division, if needed or elective)		3
Upper-division Elective		3
Upper-division Elective		3
Elective (if needed)		3
	Credit Hours	**15-16**
	Total Credit Hours	**120-127**

Learning Outcomes

By the completion of the program, students will be able to:

- Demonstrate knowledge of geographic theories and concepts in the discipline and a thorough understanding of interactions between human and environmental processes, through a geographical lens.
- Perform critical inquiry in the discipline, including acquiring, analyzing and interpreting geographical data to be used in statistical analyses, to create basic maps and perform geospatial analyses.
- Demonstrate information literacy in relevant geographic scholarship.
- Effectively communicate about geographical issues through scholarly writing, presentations and visualizations.
- Demonstrate critical thinking skills and logical approaches to problem solving within interdisciplinary settings.
- Address real-world problems by applying advanced analytical techniques ranging from qualitative, to quantitative, to spatial and field survey methodologies.