Bachelor of Arts & Bachelor of Science in Earth Sciences

Undergraduate Studies

The undergraduate program in the Department of Earth Sciences provides an understanding of the materials that constitute the earth and the processes that have shaped the earth from deep in its interior to the surface environment—geology. Geology applies all the basic sciences—biology, chemistry, mathematics, and physics—to understanding earth processes in the historical context of geologic time. It is a science that explores problems by combining field investigations with laboratory experiments and theoretical studies.

Geology also addresses many natural hazards—earthquakes, flooding, and volcanic eruptions—that affect humans. It addresses the impact of humans on the earth's surface environment, where we pollute rivers and ground water, cause rapid erosion and landslides, or attempt to re-engineer rivers and shorelines.

Geological Sciences Curriculum

The Department of Earth Sciences offers a bachelor of science (BS) or a bachelor of arts (BA) degree with a major in earth sciences.

Major Tracks

Earth science is an unusually broad subject. It addresses everything from the chemical processes that make rocks and minerals to the physics behind plate tectonics and the travel of earthquake waves through the planet. It explores the history of the evolution of life revealed in fossils, and it probes the earth processes that affect how humans can survive on the surface of the planet. To address this breadth, the department offers four curricular tracks for a major in earth sciences: geology, geophysics, environmental geoscience, and paleontology.

All of the tracks require a common core of general chemistry, calculus, general geology, and physics, except that paleontology- and environmental geoscience–track students may take two terms of biology in place of two terms of physics. Beyond the core, each track requires certain additional courses and a selection of electives.

Grade Options and Standards

Undergraduate majors must take for letter grades (the pass/no pass option is not acceptable) all the courses required in their degree program. Required courses must be completed with grades of C– or better. Exceptions for honors students are noted under Honors in Earth Sciences.

- Bachelor of Arts: Geology Track (p. 1)
- Bachelor of Science: Geology Track (p. 2)

Bachelor of Arts: Geology Track

Code	Title	Credits
Core Courses		
ERTH 101 & ERTH 102 & ERTH 103	Exploring Planet Earth and Exploring Earth's Environment and Exploring Earth History	12
or ERTH 201 & ERTH 202 & ERTH 203	Dynamic Planet Earth and Earth's Surface and Environment and History of Life	
PHYS 201–202	General Physics	8
or PHYS 251 & PHYS 252	Foundations of Physics I and Foundations of Physics I	
CH 221–222	General Chemistry	8
or CH 224H–225H	Honors General Chemistry	
MATH 251–252	Calculus I-II	8
ERTH 315	Earth Physics	4
ERTH 316	Introduction to Hydrogeology	4
ERTH 318	Introduction to Field Methods	3
ERTH 418	Earth and Environmental Data Analysis	4
or MATH 253	Calculus III	
or MATH 343	Statistical Models and Methods	
or MATH 425	Statistical Methods I	
ERTH 363	Computational Tools for Earth Sciences	4
or CIS 122	Introduction to Programming and Problem Solving	
Additional Requirements		
ERTH 331	Mineralogy	5
ERTH 332	Introduction to Petrology	5
ERTH 334	Sedimentology and Stratigraphy	4
ERTH 350 & ERTH 351 & ERTH 352	Structural Geology and Structural Geology Problems and Structural Geology Laboratory and Field	5
Field Studies:		**12**
ERTH 406	Field Studies: [Topic]	
Electives		
See Electives table for choices		20
Total Credits		106

[1] The 200-level sequence is recommended for majors; however, the 100-level sequence may be substituted if the courses are passed with grades of mid-B or better.

Electives

Code	Title	Credits
Biology		
Courses numbered 306 or higher		
Chemistry		
CH 223	General Chemistry III	4
CH 226H	Advanced General Chemistry III	4
CH 227–229	General Chemistry Laboratory	6
or CH 237–239	Advanced General Chemistry Laboratory	

CH 331	Organic Chemistry I	4
CH 335	Organic Chemistry II	4
CH 336	Organic Chemistry III	4
CH 411–413	Physical Chemistry	12
CH 431–433	Inorganic Chemistry	12
CH 444	Chemical Thermodynamics	4
CH 445	Statistical Mechanics	4
Computer and Information Science		
CIS 210–212	Computer Science I-III	12
CIS 315	Intermediate Algorithms	4
Geography		
GEOG 321	Climatology	4
GEOG 322	Geomorphology	4
GEOG 323	Biogeography	4
GEOG 360	Watershed Science and Policy	4
GEOG 361	Global Environmental Change	4
GEOG 421	Advanced Climatology: [Topic]	4
GEOG 423	Advanced Biogeography: [Topic]	4
GEOG 425	Hydrology and Water Resources	4
GEOG 427	Fluvial Geomorphology	4
GEOG 430	Long-Term Environmental Change	4
GEOG 481–482	GIScience I-II	8
GEOG 485–486	Remote Sensing I-II	8
GEOG 491	Advanced Geographic Information Systems	4
GEOG 495	Geographic Data Analysis	4
Earth Sciences		
Select from GEOL 304–310		4
ERTH 353	Geologic Hazards	4
ERTH 363	Computational Tools for Earth Sciences	4
ERTH 401	Research: [Topic]	1-21
ERTH 403	Thesis	1-6
ERTH 410	Experimental Course: [Topic]	1-5
ERTH 407	Seminar: [Topic]	1-5
Courses higher than 410		
Mathematics		
MATH 256	Introduction to Differential Equations	4
MATH 281–282	Several-Variable Calculus I-II	8
MATH 341–342	Elementary Linear Algebra	8
MATH 411–412	Functions of a Complex Variable I-II	8
MATH 421–422	Partial Differential Equations: Fourier Analysis I-II	8
MATH 425–426	Statistical Methods I-II	8
Physics		
PHYS 203	General Physics	4
or PHYS 253	Foundations of Physics I	
PHYS 204–206	Introductory Physics Laboratory	6
PHYS 290	Foundations of Physics Laboratory	1
PHYS 351–353	Foundations of Physics II	12
PHYS 411–413	Mechanics, Electricity, and Magnetism	12

[1] Pass/no pass

Bachelor of Science: Geology Track

Code	Title	Credits
Core Courses		
ERTH 101 & ERTH 102 & ERTH 103	Exploring Planet Earth and Exploring Earth's Environment and Exploring Earth History	12
or ERTH 201 & ERTH 202 & ERTH 203	Dynamic Planet Earth and Earth's Surface and Environment and History of Life	
PHYS 201–202	General Physics	8
or PHYS 251 & PHYS 252	Foundations of Physics I and Foundations of Physics I	
CH 221–222	General Chemistry	8
or CH 224H–225H	Honors General Chemistry	
MATH 251–252	Calculus I-II	8
ERTH 315	Earth Physics	4
ERTH 316	Introduction to Hydrogeology	4
ERTH 318	Introduction to Field Methods	3
ERTH 418	Earth and Environmental Data Analysis	4
or MATH 253	Calculus III	
or MATH 343	Statistical Models and Methods	
or MATH 425	Statistical Methods I	
ERTH 363	Computational Tools for Earth Sciences	4
or CIS 122	Introduction to Programming and Problem Solving	
Additional Requirements		
ERTH 331	Mineralogy	5
ERTH 332	Introduction to Petrology	5
ERTH 334	Sedimentology and Stratigraphy	4
ERTH 350 & ERTH 351 & ERTH 352	Structural Geology and Structural Geology Problems and Structural Geology Laboratory and Field	5
Field Studies:		**12**
ERTH 406	Field Studies: [Topic]	
Electives		
See Electives table for choices		20
Total Credits		106

[1] The 200-level sequence is recommended for majors; however, the 100-level sequence may be substituted if the courses are passed with grades of mid-B or better.

Electives

Code	Title	Credits
Biology		
Courses numbered 306 or higher		
Chemistry		
CH 223	General Chemistry III	4
CH 226H	Advanced General Chemistry III	4
CH 227–229	General Chemistry Laboratory	6
or CH 237–239	Advanced General Chemistry Laboratory	

CH 331	Organic Chemistry I	4
CH 335	Organic Chemistry II	4
CH 336	Organic Chemistry III	4
CH 411–413	Physical Chemistry	12
CH 431–433	Inorganic Chemistry	12
CH 444	Chemical Thermodynamics	4
CH 445	Statistical Mechanics	4
Computer and Information Science		
CIS 210–212	Computer Science I-III	12
CIS 315	Intermediate Algorithms	4
Geography		
GEOG 321	Climatology	4
GEOG 322	Geomorphology	4
GEOG 323	Biogeography	4
GEOG 360	Watershed Science and Policy	4
GEOG 361	Global Environmental Change	4
GEOG 421	Advanced Climatology: [Topic]	4
GEOG 423	Advanced Biogeography: [Topic]	4
GEOG 425	Hydrology and Water Resources	4
GEOG 427	Fluvial Geomorphology	4
GEOG 430	Long-Term Environmental Change	4
GEOG 481–482	GIScience I-II	8
GEOG 485–486	Remote Sensing I-II	8
GEOG 491	Advanced Geographic Information Systems	4
GEOG 495	Geographic Data Analysis	4
Earth Sciences		
Select from GEOL 304–310		4
ERTH 353	Geologic Hazards	4
ERTH 363	Computational Tools for Earth Sciences	4
ERTH 401	Research: [Topic]	1-21
ERTH 403	Thesis	1-6
ERTH 410	Experimental Course: [Topic]	1-5
ERTH 407	Seminar: [Topic]	1-5
Courses higher than 410		
Mathematics		
MATH 256	Introduction to Differential Equations	4
MATH 281–282	Several-Variable Calculus I-II	8
MATH 341–342	Elementary Linear Algebra	8
MATH 411–412	Functions of a Complex Variable I-II	8
MATH 421–422	Partial Differential Equations: Fourier Analysis I-II	8
MATH 425–426	Statistical Methods I-II	8
Physics		
PHYS 203	General Physics	4
or PHYS 253	Foundations of Physics I	
PHYS 204–206	Introductory Physics Laboratory	6
PHYS 290	Foundations of Physics Laboratory	1
PHYS 351–353	Foundations of Physics II	12
PHYS 411–413	Mechanics, Electricity, and Magnetism	12

[1] Pass/no pass

- Bachelor of Arts: Geophysics Track (p. 3)
- Bachelor of Science: Geophysics Track (p. 4)

Bachelor of Arts: Geophysics Track

Code	Title	Credits
ERTH 315	Earth Physics	4
ERTH 363	Computational Tools for Earth Sciences	4
or CIS 122	Introduction to Programming and Problem Solving	
PHYS 251–253	Foundations of Physics I	12
MATH 251–253	Calculus I-III	12
CH 221–222	General Chemistry	8
or CH 224H–225H	Honors General Chemistry	
ERTH 455	Mechanical Earth	4
Additional Requirements		
Select two of the following:		7-8
ERTH 441	Hillslope Geomorphology	
ERTH 451	Hydrogeology	
ERTH 452	Neotectonics and Quaternary Geology	
ERTH 453	Tectonics	
ERTH 454	Fluid Dynamics	
ERTH 462	Environmental Geomechanics	
ERTH 463	Computational Earth Science	
ERTH 466	Geodynamics	
ERTH 467	Fault Mechanics	
ERTH 468	Introduction to Seismology	
MATH 256	Introduction to Differential Equations	4
MATH 281–282 & MATH 256	Several-Variable Calculus I-II and Introduction to Differential Equations	12
PHYS 351–353	Foundations of Physics II	12
or PHYS 411–413	Mechanics, Electricity, and Magnetism	
Electives		
See Electives table for choices		28
Total Credits:		**104**

[1] The 200-level sequence is recommended for majors; however, the 100-level sequence may be substituted if the courses are passed with grades of mid-B or better.

Electives

Code	Title	Credits
Chemistry		
CH 223	General Chemistry III	4
CH 226H	Advanced General Chemistry III	4
CH 411	Physical Chemistry	4
Earth Sciences		
Select from GEOL 101–310		8
ERTH 311	Earth Materials	5
ERTH 316	Introduction to Hydrogeology	4
ERTH 318	Introduction to Field Methods	3
ERTH 334	Sedimentology and Stratigraphy	4
ERTH 350	Structural Geology	3

ERTH 351	Structural Geology Problems	1
ERTH 352	Structural Geology Laboratory and Field	1
ERTH 353	Geologic Hazards	4
ERTH 363	Computational Tools for Earth Sciences	4
ERTH 401	Research: [Topic]	1-21
ERTH 403	Thesis	1-6
ERTH 407	Seminar: [Topic]	1-5
Courses numbered 408 or higher		
Mathematics		
MATH 341–342	Elementary Linear Algebra	8
or MATH 421–422	Partial Differential Equations: Fourier Analysis I-II	

[1] Pass/no pass

Bachelor of Science: Geophysics Track

Code	Title	Credits
ERTH 315	Earth Physics	4
ERTH 363	Computational Tools for Earth Sciences	4
or CIS 122	Introduction to Programming and Problem Solving	
PHYS 251–253	Foundations of Physics I	12
MATH 251–253	Calculus I-III	12
CH 221–222	General Chemistry	8
or CH 224H–225H	Honors General Chemistry	
ERTH 455	Mechanical Earth	4
Additional Requirements		
Select two of the following:		7-8
ERTH 441	Hillslope Geomorphology	
ERTH 451	Hydrogeology	
ERTH 452	Neotectonics and Quaternary Geology	
ERTH 453	Tectonics	
ERTH 454	Fluid Dynamics	
ERTH 462	Environmental Geomechanics	
ERTH 463	Computational Earth Science	
ERTH 466	Geodynamics	
ERTH 467	Fault Mechanics	
ERTH 468	Introduction to Seismology	
MATH 256	Introduction to Differential Equations	4
MATH 281–282 & MATH 256	Several-Variable Calculus I-II and Introduction to Differential Equations	12
PHYS 351–353	Foundations of Physics II	12
or PHYS 411–413	Mechanics, Electricity, and Magnetism	
Electives		
See Electives table for choices		28
Total Credits:		**104**

[1] The 200-level sequence is recommended for majors; however, the 100-level sequence may be substituted if the courses are passed with grades of mid-B or better.

Electives

Code	Title	Credits
Chemistry		
CH 223	General Chemistry III	4
CH 226H	Advanced General Chemistry III	4
CH 411	Physical Chemistry	4
Earth Sciences		
Select from GEOL 101–310		8
ERTH 311	Earth Materials	5
ERTH 316	Introduction to Hydrogeology	4
ERTH 318	Introduction to Field Methods	3
ERTH 334	Sedimentology and Stratigraphy	4
ERTH 350	Structural Geology	3
ERTH 351	Structural Geology Problems	1
ERTH 352	Structural Geology Laboratory and Field	1
ERTH 353	Geologic Hazards	4
ERTH 363	Computational Tools for Earth Sciences	4
ERTH 401	Research: [Topic]	1-21
ERTH 403	Thesis	1-6
ERTH 407	Seminar: [Topic]	1-5
Courses numbered 408 or higher		
Mathematics		
MATH 341–342	Elementary Linear Algebra	8
or MATH 421–422	Partial Differential Equations: Fourier Analysis I-II	

[1] Pass/no pass

- Bachelor of Arts: Environmental Geoscience Track (p. 4)
- Bachelor of Science: Environmental Geoscience Track (p. 5)

Bachelor of Arts: Environmental Geoscience Track

Code	Title	Credits
Core Requirements (60 or 65 credits)		
ERTH 101 & ERTH 102 & ERTH 103	Exploring Planet Earth and Exploring Earth's Environment and Exploring Earth History	12
or ERTH 201 & ERTH 202 & ERTH 203	Dynamic Planet Earth and Earth's Surface and Environment and History of Life	
ERTH 311	Earth Materials	5
or ERTH 331 & ERTH 332	Mineralogy and Introduction to Petrology	
ERTH 315	Earth Physics	4
ERTH 316	Introduction to Hydrogeology	4
ERTH 318	Introduction to Field Methods	3
ERTH 363	Computational Tools for Earth Sciences	4
or CIS 122	Introduction to Programming and Problem Solving	
PHYS 201 & PHYS 202	General Physics and General Physics	8
or PHYS 251 & PHYS 252	Foundations of Physics I and Foundations of Physics I	

CH 221–222	General Chemistry	8
or CH 224H & CH 225H	Advanced General Chemistry I and Advanced General Chemistry II	
MATH 251–252	Calculus I-II	8
or MATH 246 & MATH 247	Calculus for the Biological Sciences I and Calculus for the Biological Sciences II	
ERTH 418	Earth and Environmental Data Analysis	4
or MATH 253	Calculus III	
or MATH 343	Statistical Models and Methods	
or MATH 425	Statistical Methods I	
Electives		
See Electives table for choices		44
Total Credits		104

[1] The 200-level sequence is recommended for majors; however, the 100-level sequence may be substituted if the courses are passed with grades of mid-B or better.

Electives

Code	Title	Credits
Group A		**24**
ERTH 310	Earth Resources and the Environment	4
ERTH 334	Sedimentology and Stratigraphy	4
ERTH 353	Geologic Hazards	4
ERTH 410	Experimental Course: [Topic] (Physical Oceanography)	1-5
ERTH 410	Experimental Course: [Topic] (Soil and Environmental Chemistry)	1-5
ERTH 438	Geobiology	4
ERTH 441	Hillslope Geomorphology	4
ERTH 451	Hydrogeology	4
ERTH 455	Mechanical Earth	4
ERTH 462	Environmental Geomechanics	4
ENVS 477	Soil Science	4
Group B		**20**
Group A elective courses beyond 24 credits		
Earth Sciences		
ERTH 301 to ERTH 309 (up to 4 credits)		4
ERTH 350	Structural Geology	3
ERTH 351	Structural Geology Problems	1
ERTH 352	Structural Geology Laboratory and Field	1
ERTH 401	Research: [Topic]	1-21
ERTH 403	Thesis	1-6
ERTH 406	Field Studies: [Topic]	1-6
ERTH 407	Seminar: [Topic]	1-5
ERTH 410 and above if not taken as a Group A elective		4
Biology		
BI 212	General Biology II: Organisms	4
BI 213	General Biology III: Populations	4
BI 214	General Biology IV: Mechanisms	4
Chemistry		
CH 223	General Chemistry III	4
CH 227	General Chemistry Laboratory	2
CH 228	General Chemistry Laboratory	2
CH 229	General Chemistry Laboratory	2
CH 237	Advanced General Chemistry Laboratory	2
CH 238	Advanced General Chemistry Laboratory	2
CH 239	Advanced General Chemistry Laboratory	2
CH 331	Organic Chemistry I	4
Any Chemistry course from 331 to 499		
Computer and Information Science		
CIS 210	Computer Science I	4
CIS 211	Computer Science II	4
CIS 212	Computer Science III	4
Environmental Science		
ENVS 350	Ecological Footprint of Energy Generation	4
ENVS 465	Wetland Ecology and Management	4
Geography		
GEOG 321	Climatology	4
GEOG 322	Geomorphology	4
GEOG 323	Biogeography	4
GEOG 360	Watershed Science and Policy	4
GEOG 361	Global Environmental Change	4
GEOG 421	Advanced Climatology: [Topic]	4
GEOG 423	Advanced Biogeography: [Topic]	4
GEOG 425	Hydrology and Water Resources	4
GEOG 427	Fluvial Geomorphology	4
GEOG 430	Long-Term Environmental Change	4
GEOG 433	Fire and Natural Disturbances	4
GEOG 481	GIScience I	4
GEOG 482	GIScience II	4
GEOG 485	Remote Sensing I	4
GEOG 486	Remote Sensing II	4
GEOG 490	GIScience: [Topic]	4
GEOG 491	Advanced Geographic Information Systems	4
GEOG 494	Spatial Analysis	4
GEOG 495	Geographic Data Analysis	4
Mathematics		
MATH 256	Introduction to Differential Equations	4
MATH 282	Several-Variable Calculus II	4
MATH 341	Elementary Linear Algebra	4
MATH 342	Elementary Linear Algebra	4
MATH 411	Functions of a Complex Variable I	4
MATH 412	Functions of a Complex Variable II	4
MATH 422	Partial Differential Equations: Fourier Analysis II	4

Bachelor of Science: Environmental Geoscience Track

Code	Title	Credits
Core Requirements (60 or 65 credits)		
ERTH 101 & ERTH 102 & ERTH 103	Exploring Planet Earth and Exploring Earth's Environment and Exploring Earth History	12

or ERTH 201 & ERTH 202 & ERTH 203	Dynamic Planet Earth and Earth's Surface and Environment and History of Life	
ERTH 311	Earth Materials	5
or ERTH 331 & ERTH 332	Mineralogy and Introduction to Petrology	
ERTH 315	Earth Physics	4
ERTH 316	Introduction to Hydrogeology	4
ERTH 318	Introduction to Field Methods	3
ERTH 363	Computational Tools for Earth Sciences	4
or CIS 122	Introduction to Programming and Problem Solving	
PHYS 201 & PHYS 202	General Physics and General Physics	8
or PHYS 251 & PHYS 252	Foundations of Physics I and Foundations of Physics I	
CH 221–222	General Chemistry	8
or CH 224H & CH 225H	Advanced General Chemistry I and Advanced General Chemistry II	
MATH 251–252	Calculus I-II	8
or MATH 246 & MATH 247	Calculus for the Biological Sciences I and Calculus for the Biological Sciences II	
ERTH 418	Earth and Environmental Data Analysis	4
or MATH 253	Calculus III	
or MATH 343	Statistical Models and Methods	
or MATH 425	Statistical Methods I	
Electives		
See Electives table for choices		44
Total Credits		104

Electives

Code	Title	Credits
Group A		**24**
ERTH 310	Earth Resources and the Environment	4
ERTH 334	Sedimentology and Stratigraphy	4
ERTH 353	Geologic Hazards	4
ERTH 410	Experimental Course: [Topic] (Physical Oceanography)	1-5
ERTH 410	Experimental Course: [Topic] (Soil and Environmental Chemistry)	1-5
ERTH 438	Geobiology	4
ERTH 441	Hillslope Geomorphology	4
ERTH 451	Hydrogeology	4
ERTH 455	Mechanical Earth	4
ERTH 462	Environmental Geomechanics	4
ENVS 477	Soil Science	4
Group B		**20**
Group A elective courses beyond 24 credits		
Earth Sciences		
ERTH 301 to ERTH 309 (up to 4 credits)		4
ERTH 350	Structural Geology	3
ERTH 351	Structural Geology Problems	1
ERTH 352	Structural Geology Laboratory and Field	1
ERTH 401	Research: [Topic]	1-21
ERTH 403	Thesis	1-6
ERTH 406	Field Studies: [Topic]	1-6
ERTH 407	Seminar: [Topic]	1-5
ERTH 410 and above if not taken as a Group A elective		4
Biology		
BI 212	General Biology II: Organisms	4
BI 213	General Biology III: Populations	4
BI 214	General Biology IV: Mechanisms	4
Chemistry		
CH 223	General Chemistry III	4
CH 227	General Chemistry Laboratory	2
CH 228	General Chemistry Laboratory	2
CH 229	General Chemistry Laboratory	2
CH 237	Advanced General Chemistry Laboratory	2
CH 238	Advanced General Chemistry Laboratory	2
CH 239	Advanced General Chemistry Laboratory	2
CH 331	Organic Chemistry I	4
Any Chemistry course from 331 to 499		
Computer and Information Science		
CIS 210	Computer Science I	4
CIS 211	Computer Science II	4
CIS 212	Computer Science III	4
Environmental Science		
ENVS 350	Ecological Footprint of Energy Generation	4
ENVS 465	Wetland Ecology and Management	4
Geography		
GEOG 321	Climatology	4
GEOG 322	Geomorphology	4
GEOG 323	Biogeography	4
GEOG 360	Watershed Science and Policy	4
GEOG 361	Global Environmental Change	4
GEOG 421	Advanced Climatology: [Topic]	4
GEOG 423	Advanced Biogeography: [Topic]	4
GEOG 425	Hydrology and Water Resources	4
GEOG 427	Fluvial Geomorphology	4
GEOG 430	Long-Term Environmental Change	4
GEOG 433	Fire and Natural Disturbances	4
GEOG 481	GIScience I	4
GEOG 482	GIScience II	4
GEOG 485	Remote Sensing I	4
GEOG 486	Remote Sensing II	4
GEOG 490	GIScience: [Topic]	4
GEOG 491	Advanced Geographic Information Systems	4
GEOG 494	Spatial Analysis	4
GEOG 495	Geographic Data Analysis	4
Mathematics		
MATH 256	Introduction to Differential Equations	4
MATH 282	Several-Variable Calculus II	4
MATH 341	Elementary Linear Algebra	4
MATH 342	Elementary Linear Algebra	4
MATH 411	Functions of a Complex Variable I	4
MATH 412	Functions of a Complex Variable II	4

MATH 422	Partial Differential Equations: Fourier Analysis II	4

1 The 200-level sequence is recommended for majors; however, the 100-level sequence may be substituted if the courses are passed with grades of mid-B or better.

2 May include courses numbered 304-310.

- Bachelor of Arts: Paleontology Track (p. 7)
- Bachelor of Science: Paleontology Track (p. 8)

Bachelor of Arts: Paleontology Track

Code	Title	Credits
ERTH 101 & ERTH 102 & ERTH 103	Exploring Planet Earth and Exploring Earth's Environment and Exploring Earth History	12
or ERTH 201 & ERTH 202 & ERTH 203	Dynamic Planet Earth and Earth's Surface and Environment and History of Life	
ERTH 311	Earth Materials	5
or ERTH 331	Mineralogy	
or ERTH 332	Introduction to Petrology	
ERTH 315	Earth Physics	4
or ERTH 316	Introduction to Hydrogeology	
ERTH 318	Introduction to Field Methods	3
ERTH 363	Computational Tools for Earth Sciences	4
or CIS 122	Introduction to Programming and Problem Solving	
ERTH 418	Earth and Environmental Data Analysis	4
or MATH 253	Calculus III	
or MATH 343	Statistical Models and Methods	
or MATH 425	Statistical Methods I	
BI 211	General Biology I: Cells	4
BI 212	General Biology II: Organisms	4
or BI 213	General Biology III: Populations	
CH 221–222	General Chemistry	8
or CH 224H & CH 225H	Advanced General Chemistry I and Advanced General Chemistry II	
MATH 246–247	Calculus for the Biological Sciences I-II	8
or MATH 251–252	Calculus I-II	
PHYS 201	General Physics	4
or PHYS 251	Foundations of Physics I	
Additional Requirements		
ERTH 334	Sedimentology and Stratigraphy	4
ERTH 350 & ERTH 351 & ERTH 352	Structural Geology and Structural Geology Problems and Structural Geology Laboratory and Field	5
Field Studies:		**12**
ERTH 406	Field Studies: [Topic]	
Select two of the following:		8
ERTH 433	Paleobotany	
ERTH 434	Vertebrate Paleontology	
ERTH 435	Paleopedology	
Electives		
See Electives table for choices		16
Total Credits		105

1 The 200-level sequence is recommended for majors; however, the 100-level sequence may be substituted if the courses are passed with grades of mid-B or better.

Electives

Code	Title	Credits
Anthropology		
ANTH 361	Human Evolution	4
ANTH 366	Human Osteology Laboratory	4
ANTH 462	Primate Evolution	4
ANTH 466	Primate Feeding and Nutrition	4
ANTH 467	Paleoecology and Human Evolution	4
ANTH 471	Zooarchaeology: [Topic]	4
ANTH 479	Taphonomy: Bones, Bugs, and Burials	4
Biology		
Courses numbered 306 or higher		
Chemistry		
CH 227–229	General Chemistry Laboratory	6
or CH 237–239	Advanced General Chemistry Laboratory	
CH 223	General Chemistry III	4
CH 331	Organic Chemistry I	4
CH 335	Organic Chemistry II	4
CH 336	Organic Chemistry III	4
CH 411–413	Physical Chemistry	12
CH 431–433	Inorganic Chemistry	12
CH 444	Chemical Thermodynamics	4
CH 445	Statistical Mechanics	4
Computer and Information Science		
CIS 210–212	Computer Science I-III	12
CIS 315	Intermediate Algorithms	4
Geography		
GEOG 321	Climatology	4
GEOG 322	Geomorphology	4
GEOG 323	Biogeography	4
GEOG 360	Watershed Science and Policy	4
GEOG 361	Global Environmental Change	4
GEOG 421	Advanced Climatology: [Topic]	4
GEOG 423	Advanced Biogeography: [Topic]	4
GEOG 425	Hydrology and Water Resources	4
GEOG 427	Fluvial Geomorphology	4
GEOG 430	Long-Term Environmental Change	4
GEOG 481–482	GIScience I-II	8
GEOG 495	Geographic Data Analysis	4
Earth Sciences		
ERTH 315	Earth Physics	4
ERTH 316	Introduction to Hydrogeology	4
ERTH 353	Geologic Hazards	4
ERTH 401	Research: [Topic]	1-21

ERTH 403	Thesis	1-6
ERTH 410	Experimental Course: [Topic]	1-5
ERTH 407	Seminar: [Topic]	1-5
Courses higher than 410 [2]		
Mathematics		
MATH 256	Introduction to Differential Equations	4
MATH 281–282	Several-Variable Calculus I-II	8
MATH 341–342	Elementary Linear Algebra	8
MATH 411–412	Functions of a Complex Variable I-II	8
MATH 425–426	Statistical Methods I-II	8
Physics		
PHYS 202	General Physics	4
PHYS 203	General Physics	4
PHYS 204	Introductory Physics Laboratory	2
PHYS 205	Introductory Physics Laboratory	2
PHYS 206	Introductory Physics Laboratory	2
PHYS 253	Foundations of Physics I	4
PHYS 290	Foundations of Physics Laboratory	1
PHYS 351–353	Foundations of Physics II	12
PHYS 411–413	Mechanics, Electricity, and Magnetism	12

[1] Pass/no pass

[2] May include one course numbered 304–310.

Bachelor of Science: Paleontology Track

Code	Title	Credits
ERTH 101 & ERTH 102 & ERTH 103	Exploring Planet Earth and Exploring Earth's Environment and Exploring Earth History	12
or ERTH 201 & ERTH 202 & ERTH 203	Dynamic Planet Earth and Earth's Surface and Environment and History of Life	
ERTH 311	Earth Materials	5
or ERTH 331	Mineralogy	
or ERTH 332	Introduction to Petrology	
ERTH 315	Earth Physics	4
or ERTH 316	Introduction to Hydrogeology	
ERTH 318	Introduction to Field Methods	3
ERTH 363	Computational Tools for Earth Sciences	4
or CIS 122	Introduction to Programming and Problem Solving	
ERTH 418	Earth and Environmental Data Analysis	4
or MATH 253	Calculus III	
or MATH 343	Statistical Models and Methods	
or MATH 425	Statistical Methods I	
BI 211	General Biology I: Cells	4
BI 212	General Biology II: Organisms	4
or BI 213	General Biology III: Populations	
CH 221–222	General Chemistry	8
or CH 224H & CH 225H	Advanced General Chemistry I and Advanced General Chemistry II	
MATH 246–247	Calculus for the Biological Sciences I-II	8
or MATH 251–252	Calculus I-II	
PHYS 201	General Physics	4
or PHYS 251	Foundations of Physics I	
Additional Requirements		
ERTH 334	Sedimentology and Stratigraphy	4
ERTH 350 & ERTH 351 & ERTH 352	Structural Geology and Structural Geology Problems and Structural Geology Laboratory and Field	5
Field Studies:		**12**
ERTH 406	Field Studies: [Topic]	
Select two of the following:		8
ERTH 433	Paleobotany	
ERTH 434	Vertebrate Paleontology	
ERTH 435	Paleopedology	
Electives		
See Electives table for choices		16
Total Credits		105

[1] The 200-level sequence is recommended for majors; however, the 100-level sequence may be substituted if the courses are passed with grades of mid-B or better.

Electives

Code	Title	Credits
Anthropology		
ANTH 361	Human Evolution	4
ANTH 366	Human Osteology Laboratory	4
ANTH 462	Primate Evolution	4
ANTH 466	Primate Feeding and Nutrition	4
ANTH 467	Paleoecology and Human Evolution	4
ANTH 471	Zooarchaeology: [Topic]	4
ANTH 479	Taphonomy: Bones, Bugs, and Burials	4
Biology		
Courses numbered 306 or higher		
Chemistry		
CH 227–229	General Chemistry Laboratory	6
or CH 237–239	Advanced General Chemistry Laboratory	
CH 223	General Chemistry III	4
CH 331	Organic Chemistry I	4
CH 335	Organic Chemistry II	4
CH 336	Organic Chemistry III	4
CH 411–413	Physical Chemistry	12
CH 431–433	Inorganic Chemistry	12
CH 444	Chemical Thermodynamics	4
CH 445	Statistical Mechanics	4
Computer and Information Science		
CIS 210–212	Computer Science I-III	12
CIS 315	Intermediate Algorithms	4
Geography		
GEOG 321	Climatology	4
GEOG 322	Geomorphology	4
GEOG 323	Biogeography	4

GEOG 360	Watershed Science and Policy	4
GEOG 361	Global Environmental Change	4
GEOG 421	Advanced Climatology: [Topic]	4
GEOG 423	Advanced Biogeography: [Topic]	4
GEOG 425	Hydrology and Water Resources	4
GEOG 427	Fluvial Geomorphology	4
GEOG 430	Long-Term Environmental Change	4
GEOG 481–482	GIScience I-II	8
GEOG 495	Geographic Data Analysis	4
Earth Sciences		
ERTH 315	Earth Physics	4
ERTH 316	Introduction to Hydrogeology	4
ERTH 353	Geologic Hazards	4
ERTH 401	Research: [Topic]	1-21
ERTH 403	Thesis	1-6
ERTH 410	Experimental Course: [Topic]	1-5
ERTH 407	Seminar: [Topic]	1-5
Courses higher than 410 [2]		
Mathematics		
MATH 256	Introduction to Differential Equations	4
MATH 281–282	Several-Variable Calculus I-II	8
MATH 341–342	Elementary Linear Algebra	8
MATH 411–412	Functions of a Complex Variable I-II	8
MATH 425–426	Statistical Methods I-II	8
Physics		
PHYS 202	General Physics	4
PHYS 203	General Physics	4
PHYS 204	Introductory Physics Laboratory	2
PHYS 205	Introductory Physics Laboratory	2
PHYS 206	Introductory Physics Laboratory	2
PHYS 253	Foundations of Physics I	4
PHYS 290	Foundations of Physics Laboratory	1
PHYS 351–353	Foundations of Physics II	12
PHYS 411–413	Mechanics, Electricity, and Magnetism	12

1 Pass/no pass

2 May include one course numbered 304–310.