# MAJOR IN GEOLOGY, ENVIRONMENTAL GEOLOGY CONCENTRATION

## 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[2] | 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-bahvioral-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 344 | Stratigraphy and Sedimentology | 4A | 4 |
| GEOL 364 | Igneous and Metamorphic Petrology | 4B | 4 |
| MATH 161[3] | 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 (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives) | | 3D | 3 |
| | **Total Credits** | | **30** |

**Junior**

| | | | |
|---|---|---|---|
| GEOL 366 | Sedimentary Petrology and Geochemistry | 4A,4B | 4 |
| GEOL 372 | Structural Geology | 4B | 4 |
| GEOL 376 | Geologic Field Methods | 4A,4C | 3 |
| NR 319 | Introduction to Geospatial Science | | 4 |
| SOCR 240 | Introductory Soil Science | | 4 |
| Select one course from the following: | | | 3-5 |
| PH 122 | General Physics II (GT-SC1) | 3A | |
| PH 142 | Physics for Scientists and Engineers II (GT-SC1) | 3A | |

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|---|---|---|---|
| SOCR 470 | Soil Physics | | |
| 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** | | **28-31** |
| **Summer** | | | |
| GEOL 436 | Geology Summer Field Course | 4C | 6 |
| | **Total Credits** | | **6** |
| **Senior** | | | |
| GEOL 446 | Environmental Geology | | 3 |
| GEOL 452 | Hydrogeology | | 4 |
| GEOL 454 | Geomorphology | | 4 |
| WR 416 | Land Use Hydrology | | 3 |
| Directed Technical Electives (See list below): | | | 6 |
| Arts and Humanities (http://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities) | | 3B | 3 |
| Electives[4] | | | 0-3 |
| | **Total Credits** | | **23-26** |
| | **Program Total Credits:** | | **120** |

# Directed Technical Electives

| Code | Title | Credits |
|---|---|---|
| **Select a minimum of 6 credits from a minimum of two courses:** | | |
| AREC 342 | Water Law, Policy, and Institutions | 3 |
| ATS 440/GES 440 | Sea Level Rise and a Sustainable Future | 3 |
| BZ 471<br>& BZ 472 | Stream Biology and Ecology<br>and Stream Biology and Ecology Laboratory | 4 |
| CIVE 322 | Basic Hydrology | 3 |
| CIVE 440 | Nonpoint Source Pollution | 3 |
| CIVE 455 | Applications in Geotechnical Engineering | 3 |
| CIVE 515 | River Mechanics | 3 |
| CIVE 529 | Environmental Organic Chemistry | 3 |
| CIVE 538 | Aqueous Chemistry | 3 |
| DSCI 335 | Inferential Reasoning in Data Analysis | 3 |
| ECON 340/AREC 340 | Introduction-Economics of Natural Resources | 3 |
| GEOL 342 | Paleontology | 3 |
| GEOL 415 | Critical Zone Science | 3 |
| GEOL 440 | Geodetic and Near-Surface Geophysical Methods | 4 |
| GEOL 442 | Applied Geophysics | 4 |
| GEOL 447 | Mineral Deposits | 3 |
| GEOL 494A | Independent Study: Environmental/ Engineering Geology [5] | 1-18 |
| GEOL 498 | Research [5] | 1-6 |
| GEOL 540 | Petrophysics and Well Log Interpretation | 3 |
| GEOL 541 | Geostatistics | 2 |
| GEOL 546 | Sedimentary Basin Analysis | 4 |
| GEOL 548 | Petroleum Geology | 4 |
| GEOL 551 | Groundwater Modeling | 3 |
| GEOL 552 | Advanced Topics in Hydrogeology | 2-3 |
| GEOL 553 | Use of Tracers in Hydrogeology | 3 |
| GEOL 554 | Remote Sensing of the Earth System | 3 |
| GR 410 | Climate Change: Science, Policy, Implications | 3 |
| MATH 261 | Calculus for Physical Scientists III | 4 |
| MATH 340 | Intro to Ordinary Differential Equations | 4 |
| MATH 369 | Linear Algebra I | 3 |
| NR 323/GR 323 | Remote Sensing and Image Interpretation | 3 |
| NR 400 | Public Communication in Natural Resources | 3 |
| NR 422 | GIS Applications in Natural Resource Management | 4 |
| NR 426 | Programming for GIS I | 2 |
| NR 427 | Programming for GIS II | 2 |
| NR 450 | Geospatial Project Design and Analysis | 4 |
| NR 453 | Geospatial Field Methods in Natural Resources | 2 |
| NR 503/GR 503 | Remote Sensing and Image Analysis | 4 |
| PHIL 565 | Seminar in Environmental Philosophy | 3 |
| POLS 361 | U.S. Environmental Politics and Policy | 3 |
| SOC 461 | Water and Social Justice | 3 |
| SOCR 375 | Soil Biogeochemistry | 3 |
| SOCR 440 | Pedology | 4 |
| SOCR 467 | Soil and Environmental Chemistry | 3 |
| SOCR 470 | Soil Physics [6] | 3 |
| STAT 315 | Intro to Theory and Practice of Statistics [7] | 3 |

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| WR 417 | Watershed Measurements | 3 |
| WR 418 | Land Use and Water Quality | 3 |
| WR 419 | Water Quality Analyses | 3 |
| WR 474 | Snow Hydrology | 3 |
| WR 524/CIVE 524 | Modeling Watershed Hydrology | 3 |

1 GEOL 110, GEOL 120, GEOL 122, or GEOL 124 in combination with GEOL 121 may be substituted for GEOL 150.
2 MATH 155 may be substituted for MATH 160.
3 Students who substituted MATH 155 for MATH 160 should substitute MATH 255 for MATH 161.
4 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).
5 A maximum of one credit may be counted toward Directed Technical Electives.
6 May be selected as a Directed Technical Elective if not taken in the junior year to fulfill the physics requirement.
7 May be selected as a Directed Technical Elective if not taken in the junior year to fulfill the statistics requirement.