Miami University Department of Geology
Majors Information

Majors Offered:

Bachelor of Arts in Geology
Bachelor of Science in Geology
Bachelor of Arts in Earth Science
Bachelor of Arts in Environmental Earth Science
B.A. or B.S. with teacher licensure in Earth Science

Program Requirements: Bachelor of Arts in Geology
(36 semester hours minimum in GLG; 48 semester hours minimum including related courses)

Core Requirements (30 hours)
Any introductory 100 level (3 hr) lecture course*
GLG 115L - Laboratory (1 hr)
GLG 201 – Mineralogy (4 hrs)
GLG 204 – Survival on an Evolving Planet (4 hrs)
GLG 301 – Sedimentology and Stratigraphy (4 hrs)
GLG 322 – Structural Geology (4)
GLG 357 – Igneous & Metamorphic Petrology (4 hrs)
GLG 411A – Field Geology (6 hrs)

Electives (at least one must be at the 400 level; minimum 6 semester hours)
GLG 335 – Ice Age Earth (3 hrs)
GLG 354 – Geomorphology (4 hrs)
GLG 401 – Global Climate Change (4 hrs)
GLG 402 – Geomicrobiology (3 hrs)
GLG 408 – Intro to Hydrogeology (4 hrs)
GLG 428 – Groundwater Flow Modeling (4 hrs)
GLG 432 – X-ray Powder Diffraction and Clay Analysis (3 hrs)
GLG 435 – Soils and Paleosols (3 hrs)
GLG 436 – Paleoclimatology (3 hrs)
GLG 450 – Sedimentary Basin Analysis (3 hrs)
GLG 461 – Geophysics (3 hrs)
GLG 467 – Seismology (3 hrs)
GLG 482 – Contaminant Hydrogeology (4 hrs)
GLG 491 – Geochemistry of Natural Waters (3 hrs)
GLG 496 – Isotopes in Environmental Processes (3 hrs)

Related hours (12-16 required)
CHM 141, or CHM 141R; CHM 144 College Chemistry/College Chemistry Lab (3 or 4, 2)
MTH 151 Calculus I (5) or MTH 153 Calculus I (4) or STA 261 Applied Statistics (3)
PHY 171 College Physics (3) or PHY 181 The Physical World (4) and PHY 182 Physics Lab (1)

B.S. Additional Requirements
(42 semester hours minimum in GLG; 63 semester hours minimum including related courses

Core requirements
All courses required for the Bachelor of Arts degree in geology.

Electives
Same requirements as for the Bachelor of Arts degree in geology plus one additional 400-level course. Choose from:

GLG 401 – Global Climate change (4 hrs)
GLG 402 – Geomicrobiology (3 hrs)
GLG 408 – Intro to Hydrogeology (4 hrs)
GLG 428 – Groundwater Flow Modeling (4 hrs)
GLG 432 – X-ray Powder Diffraction and Clay Analysis (3 hrs)
GLG 435 – Soils and Paleosols (3 hrs)
GLG 436 – Paleoclimatology (3 hrs)
GLG 450 – Sedimentary Basin Analysis (3 hrs)
GLG 461 – Geophysics (3 hrs)
GLG 467 – Seismology (3 hrs)
GLG 482 – Contaminant Hydrogeology (4 hrs)
GLG 484 – X-ray Diffractometry (2)
GLG 491 – Geochemistry of Natural Waters (3 hrs)
GLG 492 – Global Tectonics (4 hrs)
GLG 496 – Isotopes in Environmental Processes (3 hrs)

Research Project
GLG 477 or 498 or equivalent research project (3 hrs); public presentation of research project

Related Hours (12-16 required)
Same requirements as for the Bachelor of Arts degree in geology plus
CHM 142, 145 College Chemistry/College Chemistry Lab (3, 2) or
GLG 211 Chemistry of Earth Systems (3)
MTH 151 Calculus I (5) or MTH 251 Calculus II (4) or STA 261 Statistics (4) or
STA 301 Applied Statistics (3)
PHY 182, 184 The Physical World/Physics Lab (4, 1) or
GLG 261 Geohazards and the Solid Earth (3)

Program Requirements: Bachelor of Arts in Earth Science
(48 semester hours minimum)

Core Requirements (4 hours)
GLG 111 – The Dynamic Earth (3 hrs) or
GLG 121 – Environmental Geology (3 hrs) or
GLG 141 – Geology of US National Parks (3 hrs) or
GLG 180 – Gems and Gem formation (3 hrs) and
GLG 115L – Laboratory (1 hr)

Electives (minimum 44 semester hours of 200-, 300-, and 400-level courses with the following distribution):

Choose up to a maximum of 20 semester hours from any 200-level course including:
GLG 201 – Mineralogy (4 hrs)
GLG 204 – Survival on an Evolving Planet (4 hrs)
GLG 211 – Chemistry of Earth Systems (3 hrs)
GLG 217 – Planetary Geology (3 hrs)
GLG 244 – Oceanography (3 hrs)
GLG 261 – Geohazards and the Solid Earth (3 hrs)

Choose from any 300-level GLG course including:
GLG 301 – Sedimentology and Stratigraphy (4 hrs)
GLG 307 – Water and Society (3 hrs)
GLG 322 – Structural Geology (4 hrs)
GLG 335 – Ice Age Earth (3 hrs)
GLG 354 – Geomorphology (4 hrs)
GLG 357 – Igneous and Metamorphic Petrology (4 hrs)

Choose at least 9 semester hours from any 400-level GLG course including:
GLG 401 – Global Climate change (4 hrs)
GLG 402 – Geomicrobiology (3 hrs)
GLG 408 – Introduction to Hydrogeology (4 hrs)
GLG 427 – Isotope Geochemistry (3 hrs)
GLG 432 – X-ray Powder Diffraction and Clay Analysis (3 hrs)
GLG 435 – Soils and Paleosols (3 hrs)
GLG 436 – Paleoclimatology (3 hrs)
GLG 450 – Sedimentary Basin Analysis (3 hrs)
GLG 461 – Geophysics (3 hrs)
GLG 467 – Seismology (3 hrs)
GLG 482 – Contaminant Hydrogeology (4 hrs)
GLG 491 – Geochemistry of Natural Waters (3 hrs)
GLG 492 – Global Tectonics (4 hrs)
GLG 496 – Isotopes in Environmental Processes (3 hrs)

Field Experience
Minimum of 3 semester hours of a field based course. May be fulfilled by credit workshops. Potential courses must be approved by GLG CDA.

Up to 12 credits of the following may substitute for any GLG 200-level course:
CHM 141 or CHM 141R; CHM 144 College Chemistry/College Chemistry Lab (3 or 4, 2)
MTH 151 Calculus I (5) or MTH 153 Calculus I (4) or STA 261 Statistics (4) or
STA 301 Applied Statistics (3)
PHY 171 College Physics (3) or PHY 181 The Physical World (4) and
PHY 183 Physics Laboratory (1)

Program Requirements: Bachelor of Arts in Environmental Earth Science (48 semester hours minimum)

Core Requirements (14 hours)

GLG 111 – The Dynamic Earth (3 hrs) or
GLG 121 – Environmental Geology (3 hrs) or
GLG 141 – Geology of US National Parks (3 hrs) or
GLG 180 – Gems and Gem formation (3 hrs) and
GLG 115L – Laboratory (1 hr)

One of these:

ENV 274 – Introduction to Environmental Principles (3 hrs)
GLG 275 – Principles of Environmental Science (3 hrs)
GEO 271 – Human Dimensions of Natural Resource Conservation (3 hrs)

One of these:

GLG 301 – Sedimentology and Stratigraphy (4 hrs)
GLG 354 – Geomorphology (4 hrs)

One of these:

GLG 307 – Water and Society (3 hrs)
GLG 408 – Introduction to Hydrogeology (4 hrs)
GLG 491 – Geochemistry of Natural Waters (3 hrs)

Electives (Minimum 19 semester hours):

Choose at least three of these:

GLG 201 – Mineralogy (4 hrs)
GLG 204 – Survival on an Evolving Planet (4 hrs)
GLG 244 – Oceanography (3 hrs)
GLG 301 – Sedimentology and Stratigraphy (4 hrs)
GLG 307 – Water and Society (3 hrs)
GLG 335 – Ice Age Earth (3 hrs)
GLG 354 – Geomorphology (4 hrs)

Choose at least three of these, at least two of which must be in Geology:

GLG 401 – Global Climate change (4 hrs)
GLG 402 – Geomicrobiology (3 hrs)
GLG 408 – Intro to Hydrogeology (4 hrs)
GLG 435 – Soils and Paleosols (3 hrs)
GLG 436 – Paleoclimatology (3 hrs)
GLG 482 – Contaminant Hydrogeology (4 hrs)
GLG 491 – Geochemistry of Natural Waters (3 hrs)
GLG 496 – Isotopes in Environmental Processes (3 hrs)
GEO 425 – Hydrogeography (3 hrs)
GEO 426 – Watershed Management (3 hrs)
GEO 441 – Geographic Information Systems (3 hrs)
GEO 442 – Advanced Geographic Information Systems (3 hrs)
GEO 448 – Techniques and Applications of Remote Sensing (3 hrs)

GLG 491 – Sustainability Perspectives in Resources and Business (3 hrs)
IES 450 – Environmental Law (3 hrs)

Field experience
Minimum of 3 semester hours of a field based course. May be fulfilled by credit workshops. Potential course must be approved by GLG CDA.

Related hours (minimum of 12 hours required)

Choose one of these:
CHM 141, 144 College Chemistry/College Chemistry Lab (3, 2)
CHM 141R, 144 College Chemistry/College Chemistry Lab (4, 2)
GLG 211 Chemistry of Earth Systems (3 hrs)

Choose one of these:
MTH 151 Calculus I (5) or MTH 153 Calculus I (4) or MTH 251 Calculus II (4) or
STA 261 Statistics (4) or STA 301 Applied Statistics (3)

Choose one of these:
PHY 171, 183 College Physics/Physics Lab (3, 1 hrs)
PHY 181, 183 The Physical World/Physics Lab (4, 1 hrs)
GLG 261 Geohazards and the Solid Earth (3 hrs)

Choose one of these:
BOT/MBI/ZOO 115 Biological Concepts: Ecology, Evolution, Genetics & Diversity (4 hrs)
BOT 131 Plants, Humanity, and Environment (3 hrs)
BOT 171 Ecology of North America (3 hrs)
BOT 191 General Botany (4 hrs)
ZOO 113 Animal Diversity (4 hrs)
ZOO 121 Environmental Biology (3 hrs)
ZOO 204 Fundamentals of Ecology (3 hrs)

Teacher Licensure

Students who wish to combine teacher licensure with an Arts and Science major must observe the rules, procedures and restrictions pertaining to admission to a licensure cohort as outlined in the School of Education and Allied Professions chapter. For information contact the Office of Student Services in the School of Education and Allied Professions, 200 McGuffey Hall (513-529-6418).

For additional questions or concerns, contact either Dr. John Rakovan, via email at rakovajf@muohio.edu, by phone at 513-529-3245 or Dr. William K. Hart via email at hartwk@muohio.edu or by phone at 513-529-3216.