Bachelor of Science in Geology

Why study geology?

In Geology you get to apply techniques and knowledge from chemistry, physics, biology and math to answer important questions about Earth processes, history and future. Geologists are in demand to evaluate geologic hazards, evaluate natural resources, and understand the environment.

The B.S. program (http://geo.ku.edu/overview) provides intensive training in geology and other sciences. B.S. majors may emphasize traditional geology, environmental geology (with a specialized track in hydrogeology), engineering geology, geophysics, or earth and space science licensure. The hydrogeology track, the engineering geology option, and the geophysics option combine basic training in geology with training in mathematics, engineering, physics, and geophysics. The environmental geology option combines training in geology with many different sciences.

Undergraduate Admission

Admission to KU

All students applying for admission must send high school and college transcripts to the Office of Admissions. Unless they are college transfer students with at least 24 hours of credit, prospective students must send ACT or SAT scores to the Office of Admissions. Prospective first-year students should be aware that KU has qualified admission requirements that all new first-year students must meet to be admitted. Consult the Office of Admissions (http://admissions.ku.edu) for application deadlines and specific admission requirements.

Visit the International Support Services (http://www.iss.ku.edu) for information about international admissions.

Students considering transferring to KU may see how their college-level course work will transfer on the Office of Admissions (http://credittransfer.ku.edu) website.

Admission to the College of Liberal Arts and Sciences

Admission to the College is a different process from admission to a major field. Some CLAS departments have admission requirements. See individual department/program sections for departmental admission requirements.

Geology Programs

The B.S. program provides intensive training in geology and other sciences. B.S. majors may emphasize traditional geology, environmental geology (with a specialized track in hydrogeology), engineering geology, geophysics, or earth and space science licensure. The hydrogeology track, the engineering geology option, and the geophysics option combine basic training in geology with training in mathematics, engineering, physics, and geophysics. The environmental geology option combines training in geology with many different sciences.

Degree requirements may be altered to suit particular needs of a student upon petition to the undergraduate studies committee and in consultation with a geology faculty advisor. Special consideration is given to students with strong backgrounds in supporting sciences and students with superior records who decide to major in geology late in their programs.

First- and Second-Year Preparation

Students interested in geology, especially in the B.S. degree, should see a department advisor as soon as possible. They should enroll in mathematics, chemistry, and English in addition to Introduction to Geology and electives. Students should take GEOL 360 as soon as possible.

Advising

Developing a strong relationship with a faculty advisor helps students get the most out of their educational programs in the shortest time. Most courses for majors are offered in only one semester each year. Advisors can guide the student through complexities of the curriculum or into a specialized program.

Requirements for the B.S. Degree

The B.S. program provides intensive training in geology and other sciences. B.S. majors may emphasize traditional geology, environmental geology (with a specialized track in hydrogeology), engineering geology, geophysics, or earth and space science licensure. The hydrogeology track, the engineering geology option, and the geophysics option combine basic training in geology with training in mathematics, engineering, physics, and geophysics. The environmental geology option combines training in geology with many different sciences.

Degree requirements may be altered to suit particular needs of a student upon petition to the undergraduate studies committee and in consultation with a geology faculty advisor. Special consideration is given to students with strong backgrounds in supporting sciences and students with superior records who decide to major in geology late in their programs.

General Geology Option

Written Communication - Core Skill and Critical Inquiry.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 101</td>
<td>Composition</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Satisfied by one of the following. Requirement must be completed during initial term of admission at KU.</td>
<td></td>
</tr>
<tr>
<td>ACT English score of 27 or above or SAT English score of 600 or above</td>
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<tr>
<td>AP English Literature &amp; Composition score of 3 or above</td>
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<tr>
<td></td>
<td>Equivalent transfer course</td>
<td></td>
</tr>
<tr>
<td>ENGL 102</td>
<td>Critical Reading and Writing</td>
<td>3</td>
</tr>
<tr>
<td>or ENGL 105</td>
<td>Honors Introduction to English</td>
<td></td>
</tr>
<tr>
<td></td>
<td>AP English Literature &amp; Composition score of 4 or above</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Equivalent transfer course</td>
<td></td>
</tr>
<tr>
<td>ENGL 203</td>
<td>Topics in Reading and Writing:</td>
<td>3</td>
</tr>
<tr>
<td>or ENGL 205</td>
<td>Freshman-Sophomore Honors Proseminar:</td>
<td></td>
</tr>
<tr>
<td>ENGL 209</td>
<td>Introduction to Fiction</td>
<td>3</td>
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</table>

Bachelor of Science in Geology
ENGL 210  Introduction to Poetry  3
ENGL 211  Introduction to the Drama  3
ENGL 362  Foundations of Technical Writing  3

AP English Literature & Composition score of 5 or above
Equivalent

**Communications.**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>COMS 130</td>
<td>Speaker-Audience Communication</td>
<td>3</td>
</tr>
<tr>
<td>or COMS 150</td>
<td>Personal Communication</td>
<td></td>
</tr>
</tbody>
</table>

**Humanities - Understanding the Human Condition.** Satisfied by completing 2 courses (requirement code H). Approved courses may be searched for availability through the Kyou portal.

**Social and Behavioral Sciences - Understanding Society and Behavior.** Satisfied by completing 2 courses (requirement code S). Approved courses may be searched for availability through the Kyou portal. An introductory course in economics is recommended.

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<tr>
<th>Code</th>
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<th>Hours</th>
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<tbody>
<tr>
<td></td>
<td>Geology Prerequisite or Co-requisite Knowledge</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Geology Core Knowledge and Skills</td>
<td></td>
</tr>
<tr>
<td></td>
<td>History and Geology - Understanding the Human Condition</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Social and Behavioral Sciences - Understanding Society and Behavior</td>
<td>3</td>
</tr>
</tbody>
</table>

**Geology Core Knowledge and Skills**

Majors must complete the following core courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 125</td>
<td>Calculus I (Prerequisite: MATH 104; or MATH 103; 4</td>
<td></td>
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<tr>
<td></td>
<td>or three years of college preparatory mathematics including trigonometry and a score of 28 or higher on ACT mathematics or 640 or higher on the SAT; or a qualifying score on the mathematics placement test.)</td>
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</table>

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 126</td>
<td>Calculus II</td>
<td>4</td>
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<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>CHEM 130</td>
<td>General Chemistry I</td>
<td>10</td>
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<tr>
<td>CHEM 135</td>
<td>and General Chemistry II</td>
<td></td>
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<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHSX 211</td>
<td>General Physics I</td>
<td>5</td>
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<tr>
<td>PHSX 216</td>
<td>and General Physics I Laboratory</td>
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<tr>
<td>PHSX 212</td>
<td>General Physics II</td>
<td>4</td>
</tr>
<tr>
<td>PHSX 236</td>
<td>and General Physics II Laboratory</td>
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<tr>
<td>BIOL 150</td>
<td>Principles of Molecular and Cellular Biology</td>
<td>4</td>
</tr>
<tr>
<td>ECE 138</td>
<td>Introduction to Computing: _____</td>
<td>3</td>
</tr>
<tr>
<td>C&amp;PE 325</td>
<td>Numerical Methods and Statistics for Engineers</td>
<td>3</td>
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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEO 101</td>
<td>The Way The Earth Works</td>
<td>3</td>
</tr>
<tr>
<td>GEO 103</td>
<td>Geology Fundamentals Laboratory</td>
<td>2</td>
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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>GEO 104</td>
<td>Historical Geology</td>
<td>3</td>
</tr>
<tr>
<td>GEO 111</td>
<td>Mineralogy and Structure of the Earth</td>
<td>3</td>
</tr>
<tr>
<td>GEO 112</td>
<td>Mineral Structures and Equilibria Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>GEO 113</td>
<td>Sedimentology and Stratigraphy</td>
<td>4</td>
</tr>
<tr>
<td>GEO 114</td>
<td>Field Investigation</td>
<td>2</td>
</tr>
<tr>
<td>GEO 115</td>
<td>Igneous and Metamorphic Petrology</td>
<td>3</td>
</tr>
<tr>
<td>GEO 116</td>
<td>Petrology Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>GEO 117</td>
<td>Introductory Field Geology</td>
<td>3</td>
</tr>
<tr>
<td>GEO 118</td>
<td>Field Geology</td>
<td>3</td>
</tr>
<tr>
<td>GEO 119</td>
<td>Structural Geology</td>
<td>4</td>
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</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>GEO 121</td>
<td>Error Analysis</td>
<td></td>
</tr>
<tr>
<td>GEO 122</td>
<td>Linear Algebra for Earth Scientists</td>
<td></td>
</tr>
<tr>
<td>GEO 123</td>
<td>Numerical Methods in the Earth Sciences</td>
<td></td>
</tr>
<tr>
<td>GEO 124</td>
<td>Raman Spectroscopy of Crystalline Solids</td>
<td></td>
</tr>
<tr>
<td>GEO 125</td>
<td>Shales and Other Mudstones</td>
<td></td>
</tr>
<tr>
<td>GEO 126</td>
<td>Volcanology</td>
<td></td>
</tr>
<tr>
<td>GEO 127</td>
<td>Geological Log Analysis</td>
<td></td>
</tr>
<tr>
<td>GEO 128</td>
<td>Petroleum Reservoir Characterization</td>
<td></td>
</tr>
<tr>
<td>GEO 129</td>
<td>Basin Analysis</td>
<td></td>
</tr>
<tr>
<td>GEO 130</td>
<td>Petroleum and Subsurface Geology</td>
<td></td>
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<tr>
<td>GEO 131</td>
<td>Geophysics</td>
<td></td>
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<tr>
<td>GEO 132</td>
<td>Introduction to Hydrogeology</td>
<td></td>
</tr>
<tr>
<td>GEO 133</td>
<td>Contaminants in Groundwater</td>
<td></td>
</tr>
<tr>
<td>GEO 134</td>
<td>Climate Science</td>
<td></td>
</tr>
<tr>
<td>GEO 135</td>
<td>Applied Groundwater Modeling</td>
<td></td>
</tr>
<tr>
<td>GEO 136</td>
<td>Environmental Geophysics</td>
<td></td>
</tr>
<tr>
<td>GEO 137</td>
<td>Hydrogeophysics</td>
<td></td>
</tr>
</tbody>
</table>
Bachelor of Science in Geology

GEOL 591  Topics in Geology: _____ (Climate: Past, Present and Future)

Major Hours & Major GPA

While completing all required courses, majors must also meet each of the following hour and grade-point average minimum standards:

**Major Hours**
Satisfied by 50 hours of major courses.

**Major Hours in Residence**
Satisfied by a minimum of 15 hours of KU resident credit in the major.

**Major Junior/Senior Hours**
Satisfied by a minimum of 18 hours from junior/senior courses (300+) in the major.

**Major Junior/Senior Graduation GPA**
Satisfied by a minimum of a 2.0 KU GPA in junior/senior courses (300+) in the major. GPA calculations include all junior/senior courses in the field of study including F's and repeated courses. See the Semester/Cumulative GPA Calculator (http://clas.ku.edu/undergrad/tools/gpa).

Engineering Geology Option

Written Communication - Core Skill and Critical Inquiry.

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<td></td>
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<tr>
<td></td>
<td>Equivalent transfer course</td>
<td></td>
</tr>
</tbody>
</table>

Critical Reading and Writing
Satisfied by one of the following. Requirement must be completed within the first academic year at KU.

| ENGL 102 | Critical Reading and Writing | 3     |
|          | or ENGL 105                 |       |
|          | Honors Introduction to English |       |
|          | AP English Literature & Composition score of 4 or above |       |
|          | Equivalent transfer course  |       |

Sophomore Reading and Writing II
Satisfied by one of the following:

| ENGL 362 | Foundations of Technical Writing | 3     |
|          | AP English Literature & Composition score of 5 or above |       |
|          | Equivalent               |       |

Communications.

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<tr>
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</tbody>
</table>

Humanities - Understanding the Human Condition. Satisfied by completing 2 courses (requirement code H). Approved courses may be searched for availability through the Kyou portal.

Social and Behavioral Sciences - Understanding Society and Behavior. Satisfied by completing 2 courses (requirement code S). Approved courses may be searched for availability through the Kyou portal. An introductory course in economics is recommended.

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<td>The Way The Earth Works</td>
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<tr>
<td>GEOL 103</td>
<td>Geology Fundamentals Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>GEOL 304</td>
<td>Historical Geology</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 311</td>
<td>Mineralogy and Structure of the Earth</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 312</td>
<td>Mineral Structures and Equilibria Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>GEOL 331</td>
<td>Sedimentology and Stratigraphy</td>
<td>4</td>
</tr>
<tr>
<td>GEOL 351</td>
<td>Environmental Geology</td>
<td>3</td>
</tr>
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</table>

Field Investigation. Satisfied by:
Bachelor of Science in Geology

GEOL 360  Field Investigation 2
Igneous and Metamorphic Petrology. Satisfied by:
GEOL 512  Igneous and Metamorphic Petrology 3
Petrology Laboratory. Satisfied by:
GEOL 513  Petrology Laboratory 1
Geomorphology. Satisfied by:
GEOL 541  Geomorphology 4
Introductory Field Geology. Satisfied by:
GEOL 560  Introductory Field Geology 3
Field Geology. Satisfied by:
GEOL 561  Field Geology 3
Structural Geology. Satisfied by:
GEOL 562  Structural Geology 4
Geophysics or Geodynamics and Plate Tectonics. Satisfied by one of
GEOL 572  Geophysics 3

Geology or Civil Engineering Required Electives
Majors must complete three additional geology or civil engineering
courses, at least two of which must be from the following:
GEOL 521  Paleontology 3
GEOL 535  Petroleum and Subsurface Geology 4
GEOL 715  Geochemistry 3
GEOL 751  Physical Hydrogeology 3
CE 770  Concepts of Environmental Chemistry 3
CE 771  Environmental Engineering Laboratory 3
Electives may include an upper-division course in statistics:
MATH 365  Elementary Statistics 3
or BIOL 570  Introduction to Biostatistics

Major Hours & Major GPA

While completing all required courses, majors must also meet each of the
following hour and grade-point average minimum standards:

Major Hours
Satisfied by 45 hours of major courses.

Major Hours in Residence
Satisfied by a minimum of 15 hours of KU resident credit in the major.

Major Junior/Senior Hours
Satisfied by a minimum of 18 hours from junior/senior courses (300+) in
the major.

Major Junior/Senior Graduation GPA
Satisfied by a minimum of 2.0 KU GPA in junior/senior courses (300+) in
the major. GPA calculations include all junior/senior courses in the field of
study including F's and repeated courses. See the Semester/Cumulative

Environmental Geology Option

Written Communication - Core Skill and Critical Inquiry.

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<td>Composition</td>
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ACT English score of 27 or above or SAT English score of 600 or
above
AP English Literature & Composition score of 3 or above
Equivalent transfer course

Critical Reading and Writing
Satisfied by one of the following. Requirement must be completed
within the first academic year at KU.
ENGL 102  Critical Reading and Writing 3
or ENGL 105  Honors Introduction to English
AP English Literature & Composition score of 4 or above
Equivalent transfer course

Sophomore Reading and Writing II
Satisfied by one of the following:
ENGL 203  Topics in Reading and Writing: _____ 3
or ENGL 205  Freshman-Sophomore Honors Proseminar: _____
ENGL 209  Introduction to Fiction 3
ENGL 210  Introduction to Poetry 3
ENGL 211  Introduction to the Drama 3
ENGL 362  Foundations of Technical Writing 3
AP English Literature & Composition score of 5 or above
Equivalent

Communications.

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Humanities - Understanding the Human Condition. Satisfied by
completing 2 courses (requirement code H). Approved courses may be
searched for availability through the Kyou portal.

Social and Behavioral Sciences - Understanding Society and
Behavior. Satisfied by completing 2 courses (requirement code S).
Approved courses may be searched for availability through the Kyou
portal. An introductory course in economics is recommended.

Geology Prerequisite or Co-requisite Knowledge
Majors must complete courses as specified in each of the following
areas. Majors are advised to take honors courses when eligible. These hours do not contribute to the minimum number of hours
required for the major.

Calculus I. Satisfied by:
MATH 125  Calculus I 4
Calculus II. Satisfied by:
MATH 126  Calculus II 4
Chemistry. Satisfied by:
CHEM 130  General Chemistry I 4
& CHEM 135  and General Chemistry II 4
Physics. Satisfied by:
PHSX 211  General Physics I 4
& PHSX 216  and General Physics I Laboratory 4
PHSX 212  General Physics II 4
& PHSX 236  and General Physics II Laboratory (recommended) 4

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</table>
Bachelor of Science in Geology

PHSX 114 College Physics I and College Physics II 2-8

Biology. Satisfied by:
BIOL 150 Principles of Molecular and Cellular Biology 8
& BIOL 152 Principles of Organismal Biology

Information Technology. Satisfied by one of the following:
EECS 138 Introduction to Computing: _____ 3
C&PE 325 Numerical Methods and Statistics for Engineers 3

Geology Core Knowledge and Skills

Majors must complete the following core courses:

Introduction to Geology. Satisfied by:
GEOL 101 The Way The Earth Works 3

Geology Fundamentals Laboratory. Satisfied by:
GEOL 103 Geology Fundamentals Laboratory 2

Historical Geology. Satisfied by:
GEOL 304 Historical Geology 3

Mineralogy and Structure of the Earth. Satisfied by:
GEOL 311 Mineralogy and Structure of the Earth 3

Sedimentology and Stratigraphy. Satisfied by:
GEOL 331 Sedimentology and Stratigraphy 4

Environmental Geology. Satisfied by:
GEOL 351 Environmental Geology 3

Field Investigation. Satisfied by:
GEOL 360 Field Investigation 2

Paleontology. Satisfied by:
GEOL 521 Paleontology 3

Geomorphology. Satisfied by:
GEOL 541 Geomorphology 4

Introduction to Hydrogeology. Satisfied by:
GEOL 552 Introduction to Hydrogeology 3

Introductory Field Geology. Satisfied by:
GEOL 560 Introductory Field Geology 3

Structural Geology. Satisfied by:
GEOL 562 Structural Geology 4

Geophysics. Satisfied by:
GEOL 572 Geophysics 3

Geology Required Electives

Majors must complete additional courses to total at least nine hours numbered 500 or above. The following are recommended:

GEOL 391 Special Studies in Geology 1-6
GEOL 535 Petroleum and Subsurface Geology 4
GEOL 715 Geochemistry 3
GEOL 751 Physical Hydrogeology 3
CE 770 Concepts of Environmental Chemistry & Environmental Engineering Laboratory 6
GEOG 535 Soil Geography 4
GEOG 558 Intermediate Geographical Information Systems 4
GEOL 753 Chemical and Microbial Hydrogeology 4
BIOL 400 Fundamentals of Microbiology 3

Environmental Hydrogeology Track

Besides the general program above, a specialized track in hydrogeology satisfies degree requirements. In addition to College, supporting science, and geology courses, the environmental hydrogeology track requires the following mathematics and civil engineering/physics courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>MATH 220</td>
<td>Applied Differential Equations</td>
<td>3</td>
</tr>
<tr>
<td>MATH 290</td>
<td>Elementary Linear Algebra</td>
<td>2</td>
</tr>
<tr>
<td>CE 330</td>
<td>Fluid Mechanics</td>
<td>3</td>
</tr>
</tbody>
</table>

In addition, Technical Electives (9 hours). These normally are chosen from courses numbered 500 or above in geology, physics, mathematics, chemistry, engineering or computer science. Courses numbered below 500 must be approved by a geology advisor.

Major Hours & Major GPA

While completing all required courses, majors must also meet each of the following hour and grade-point average minimum standards:

Major Hours
Satisfied by 49 hours of major courses.

Major Hours in Residence
Satisfied by a minimum of 15 hours of KU resident credit in the major.

Major Junior/Senior Hours
Satisfied by a minimum of 45 hours from junior/senior courses (300+) in the major.

Major Junior/Senior Graduation GPA
Satisfied by a minimum of a 2.0 KU GPA in junior/senior courses (300+) in the major. GPA calculations include all junior/senior courses in the field of study including F's and repeated courses. See the Semester/Cumulative GPA Calculator (http://clas.ku.edu/undergrad/tools/gpa).

Geophysics Option

Written Communication - Core Skill and Critical Inquiry.

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<tr>
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<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 101</td>
<td>Composition</td>
<td>3</td>
</tr>
</tbody>
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| ACT English score of 27 or above or SAT English score of 600 or above
| AP English Literature & Composition score of 3 or above
| Equivalent transfer course |

Critical Reading and Writing
Satisfied by one of the following. Requirement must be completed during initial term of admission at KU.

| ENGL 102 | Critical Reading and Writing | 3 |
| or ENGL 105 | Honors Introduction to English | |
| AP English Literature & Composition score of 4 or above
| Equivalent transfer course |

Sophomore Reading and Writing II
Satisfied by one of the following:

| ENGL 203 | Topics in Reading and Writing: _____ | 3 |
| or ENGL 205 | Freshman-Sophomore Honors Proseminar: _____ | |
| ENGL 209 | Introduction to Fiction | 3 |
| ENGL 210 | Introduction to Poetry | 3 |
ENGL 211 Introduction to the Drama 3
ENGL 362 Foundations of Technical Writing 3
AP English Literature & Composition score of 5 or above
Equivalent

Humanities - Understanding the Human Condition. Satisfied by completing 2 courses (requirement code H). Approved courses may be searched for availability through the Kyou portal.

Social and Behavioral Sciences - Understanding Society and Behavior. Satisfied by completing 2 courses (requirement code S). Approved courses may be searched for availability through the Kyou portal. An introductory course in economics is recommended.

Code Title Hours
GEOL 331 Sedimentology and Stratigraphy 4
Field Investigation. Satisfied by:
GEOL 360 Field Investigation 2
Igneous and Metamorphic Petrology. Satisfied by:
GEOL 512 Igneous and Metamorphic Petrology 3
Introductory Field Geology. Satisfied by:
GEOL 560 Introductory Field Geology 3
Structural Geology. Satisfied by:
GEOL 562 Structural Geology 4
Geophysics. Satisfied by one of the following:
GEOL 572 Geophysics 3

Additional Geology Courses
Geophysics elective 500 and above (at least 9 hours) 9
GEOL 575 Seismic Exploration
GEOL 577 Environmental Geophysics
GEOL 578 Seismic Data Analysis and Interpretation
GEOL 776 Ground Penetrating Radar

Technical Required Electives
6
At least 6 hours from the list below or other 500 and above Geology, Physics, Mathematics, Engineering, or Computer Science.

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Primary Science Tracks

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Bachelor of Science in Geology

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Social and Behavioral Sciences - Understanding Society and Behavior. Satisfied by completing 2 courses (requirement code S). Approved courses may be searched for availability through the Kyou portal. An introductory course in economics is recommended.

Majors must complete courses as specified in each of the following areas. Majors are advised to take honors courses when eligible. These hours do not contribute to the minimum number of hours required for the major.

Calculus I. Satisfied by:
Calculus II. Satisfied by:
Vector Calculus and Elementary Linear Algebra. Satisfied by:
MATH 125 Calculus I 4
MATH 126 Calculus II 4
MATH 127 Calculus III 4
MATH 290 Elementary Linear Algebra 2
Elementary Differential Equations. Satisfied by:
MATH 320 Elementary Differential Equations 3
Chemistry. Satisfied by:
CHEM 130 General Chemistry I 10
& CHEM 135 and General Chemistry II
Physics. Satisfied by:
PHSX 211 General Physics I 5
& PHSX 216 and General Physics I Laboratory
PHSX 212 General Physics II 4
& PHSX 236 and General Physics II Laboratory
PHSX 313 General Physics III 3
PHSX 521 Mechanics I 3
PHSX 531 Electricity and Magnetism 3
or EECS 220 Electromagnetics I
Intro to Computing. Satisfied by one of the following:
EECS 138 Introduction to Computing: _____ 3
Demonstrate equivalent programming skills

Geology Core Knowledge and Skills

Majors must complete the following core courses:
Introduction to Geology. Satisfied by:
GEOL 101 The Way The Earth Works 3
Geology Fundamentals Laboratory. Satisfied by:
GEOL 103 Geology Fundamentals Laboratory 2
Historical Geology. Satisfied by:
GEOL 304 Historical Geology 3
Mineralogy and Structure of the Earth. Satisfied by:
GEOL 311 Mineralogy and Structure of the Earth 3
Sedimentology and Stratigraphy. Satisfied by:
GEOL 331 Sedimentology and Stratigraphy 4
Field Investigation. Satisfied by:
GEOL 360 Field Investigation 2
Igneous and Metamorphic Petrology. Satisfied by:
GEOL 512 Igneous and Metamorphic Petrology 3
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GEOL 560 Introductory Field Geology 3
Structural Geology. Satisfied by:
GEOL 562 Structural Geology 4
Geophysics. Satisfied by one of the following:
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Additional Geology Courses
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GEOL 575 Seismic Exploration
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6
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Calculus I. Satisfied by:
Calculus II. Satisfied by:
Vector Calculus and Elementary Linear Algebra. Satisfied by:
MATH 125 Calculus I 4
MATH 126 Calculus II 4
MATH 127 Calculus III 4
MATH 290 Elementary Linear Algebra 2
Elementary Differential Equations. Satisfied by:
MATH 320 Elementary Differential Equations 3
Chemistry. Satisfied by:
CHEM 130 General Chemistry I 10
& CHEM 135 and General Chemistry II
Physics. Satisfied by:
PHSX 211 General Physics I 5
& PHSX 216 and General Physics I Laboratory
PHSX 212 General Physics II 4
& PHSX 236 and General Physics II Laboratory
PHSX 313 General Physics III 3
PHSX 521 Mechanics I 3
PHSX 531 Electricity and Magnetism 3
or EECS 220 Electromagnetics I
Intro to Computing. Satisfied by one of the following:
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GEOL 103 Geology Fundamentals Laboratory 2
Historical Geology. Satisfied by:
GEOL 304 Historical Geology 3
Mineralogy and Structure of the Earth. Satisfied by:
GEOL 311 Mineralogy and Structure of the Earth 3
Sedimentology and Stratigraphy. Satisfied by:
Written Communication - Core Skill and Critical Inquiry.

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Satisfied by one of the following. Requirement must be completed during initial term of admission at KU.

ENGL 101 Composition 3

ACT English score of 27 or above or SAT English score of 600 or above

AP English Literature & Composition score of 3 or above

Equivalent transfer course

Critical Reading and Writing

Satisfied by one of the following. Requirement must be completed within the first academic year at KU.

ENGL 102 Critical Reading and Writing 3

or ENGL 105 Honors Introduction to English

AP English Literature & Composition score of 4 or above

Equivalent transfer course

Sophomore Reading and Writing II

Satisfied by one of the following:

ENGL 203 Topics in Reading and Writing: _____ 3

or ENGL 205 Freshman-Sophomore Honors Proseminar: _____

ENGL 209 Introduction to Fiction 3

ENGL 210 Introduction to Poetry 3

ENGL 211 Introduction to the Drama 3

ENGL 362 Foundations of Technical Writing 3

AP English Literature & Composition score of 5 or above

Equivalent transfer course

Communications.

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<tbody>
<tr>
<td>COMS 130 Speaker-Audience Communication</td>
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<td></td>
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<tr>
<td>or COMS 150 Personal Communication</td>
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Geology Core Knowledge and Skills

Majors must complete the following core courses:

Introduction to Geology. Satisfied by:

GEOL 101 The Way The Earth Works 3

Geology Fundamentals Laboratory. Satisfied by:

GEOL 103 Geology Fundamentals Laboratory 2

Historical Geology. Satisfied by:

GEOL 304 Historical Geology 3

Mineralogy and Structure of the Earth. Satisfied by:

GEOL 311 Mineralogy and Structure of the Earth 3

Sedimentology and Stratigraphy. Satisfied by:

GEOL 331 Sedimentology and Stratigraphy 4

Field Investigation. Satisfied by:

GEOL 360 Field Investigation 2

Paleontology. Satisfied by:

GEOL 521 Paleontology 4

& GEOL 523 Paleontology Laboratory

Introduction to Hydrogeology. Satisfied by:

GEOL 552 Introduction to Hydrogeology 3

Introductory Field Geology. Satisfied by:

GEOL 560 Introductory Field Geology 3

Structural Geology. Satisfied by:

GEOL 562 Structural Geology 4

Space Science Core Knowledge and Skills

Majors must complete the following core courses:

Introductory Meteorology. Satisfied by:

ATMO 105 Introductory Meteorology 5

Contemporary Astronomy. Satisfied by:

ASTR 191 Contemporary Astronomy 3

Earth and Space Required Electives

Majors must complete one of the areas below:

Geology Focus. Satisfied by 4 hours in a geology course numbered 300 or above.

aboveAstronomy Focus. Satisfied by 4 hours in astronomy courses numbered 300 or above. This can include three hours of GEOL 121 (if taken before the completion of 60 hours), or ASTR 390 or GEOL 399.

Research Methods

Satisfied by:

CHEM 598 Research Methods 3

Professional Development Course Work
A minimum grade of C is required in all courses.

Liberal Arts and Sciences. Satisfied by:

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Hours</th>
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<tr>
<td>LA&amp;S 290</td>
<td>Approaches to Teaching Science and Mathematics</td>
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<tr>
<td>LA&amp;S 291</td>
<td>Global Challenge: Building Communities and</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Expanding Opportunities</td>
<td></td>
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</tbody>
</table>

Curriculum and Teaching (19 hours). Satisfied by:

C&T 448 Reading and Writing across the Curriculum and 16 hours of courses approved by UKanTeach in curriculum and teaching. These should include courses such as Classroom Interactions (3), Knowing and Learning (3), Project Based Instruction (3), Student Teaching (6), and Special Topics Seminar (1).

**Major Hours & Major GPA**

While completing all required courses, majors must also meet each of the following hour and grade-point average minimum standards:

**Major Hours**

Satisfied by 46 hours of major courses.

**Major Hours in Residence**

Satisfied by a minimum of 15 hours of KU resident credit in the major.

**Major Junior/Senior Hours**

Satisfied by a minimum of 34 hours from junior/senior courses (300+) in the major.

**Major Junior/Senior Graduation GPA**

Satisfied by a minimum of a 2.0 KU GPA in junior/senior courses (300+) in the major. GPA calculations include all junior/senior courses in the field of study including F's and repeated courses. See the Semester/Cumulative GPA Calculator (http://clas.ku.edu/undergrad/tools/gpa).

**Departmental Honors**

Pursuit of departmental honors in Geology is by invitation from the Department of Geology honors coordinator. Requirements include:

3.25 or higher KU GPA at graduation.
3.50 or higher KU geology-courses GPA at graduation.
Completion of at least 2 credit hours of GEOL 399.

Completion and successful defense of an honor's thesis. Additional requirements and more information may be obtained from the Department of Geology honors coordinator and web site.