

# GEOLOGY (GEOLOGICAL SCIENCES) - BACHELOR OF SCIENCE

The concentration in geological sciences is a broad field of study that prepares students for employment by energy and mineral industries, environmental and water resource companies, federal, state and local governments, as well as service companies that utilize earth resources. Qualified students are also prepared for graduate study in the geological sciences.

Students must complete all University degree requirements, which include: **General Education requirements, Viewing a Wider World requirements**, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Students must receive a C- or better in courses.

| Prefix   | Title   | Credits    |
|--|---|------------|
| <b>General Education</b>   |   |            |
| <i>Area I: Communications</i>  |   | <b>10</b>  |
|  | English Composition - Level 1 <sup>1</sup>                  |            |
|  | English Composition - Level 2 <sup>1</sup>                  |            |
|  | Oral Communication <sup>1</sup>                             |            |
| <i>Area II: Mathematics</i>  |   | <b>3-4</b> |
| <i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>     |   | <b>11</b>  |
| GEOL 1110G   | Physical Geology  |            |
|  | or HNRS 2116G Earth, Time and Life                          |            |
| CHEM 1215G   | General Chemistry I Lecture and Laboratory for STEM Majors  |            |
| <i>Area IV: Social/Behavioral Sciences Course (3 credits) <sup>1</sup></i> |   |            |
| <i>Area V: Humanities <sup>1</sup></i>                                     |   | <b>3</b>   |
| <i>Area VI: Creative and Fine Arts <sup>1</sup></i>                        |   | <b>3</b>   |
| <i>General Education Elective</i>  |   |            |
| CHEM 1225G   | General Chemistry II Lecture and Laboratory for STEM Majors | <b>4</b>   |
| <b>Viewing A Wider World <sup>3</sup></b>                                  |   | <b>6</b>   |
| <b>Departmental/College Requirements <sup>4</sup></b>                      |   |            |
| GEOL 1150  | Introduction to Rocks and Minerals                          | <b>3</b>   |
| GEOL 305V  | Fossils and the Evolution of Life                           | <b>3</b>   |
| GEOL 312   | Mineralogy and Optics                                       | <b>3</b>   |
| GEOL 360   | General Geochemistry  | <b>3</b>   |
| GEOL 399   | Igneous and Metamorphic Petrology                           | <b>3</b>   |
| GEOL 420   | Stratigraphy and Sedimentology                              | <b>3</b>   |
| GEOL 449   | The Geological Profession                                   | <b>1</b>   |
| GEOL 470   | Structural Geology  | <b>3</b>   |
| GEOL 490   | Field Geology   | <b>3</b>   |
| GEOL 491   | Tectonic Evolution of North America                         | <b>3</b>   |
| GEOL 495   | Geology Field Camp  | <b>4</b>   |
| <i>Departmental Elective Requirements <sup>4</sup></i>                     |   |            |
| Select 12 credits from the following:                                      |   | <b>12</b>  |
| C E 357  | Soil Mechanics  |            |

|  |  |                |
|--|--|----------------|
| GEOL 335V  | Earthquakes, Volcanoes, Hurricanes, and Floods: The Role of Natural Hazards in Civ Past and Present  |                |
| GEOL 353   | Geomorphology  |                |
| GEOL 424   | Soil Chemistry   |                |
| GEOL 444   | GIS for Geology  |                |
| GEOL 452   | Geohydrology   |                |
| GEOL 465   | Isotope Geochemistry   |                |
| GEOL 478   | Petroleum Systems and Stratigraphy   |                |
| GEOL 480   | Seminar  |                |
| SOIL 2110  | Introduction to Soil Science   |                |
| <b>Non-Departmental Requirements (in addition to Gen.Ed/VWW) <sup>4</sup></b>                        |  |                |
| MATH 1511G   | Calculus and Analytic Geometry I   | <b>4</b>       |
|  | or MATH 1430G Applications of Calculus I   |                |
| MATH 1521G   | Calculus and Analytic Geometry II (Choose one sequence from the following (4 credits):) <sup>2</sup> | <b>3-4</b>     |
|  | or MATH 1440 Applications of Calculus II   |                |
| Choose one sequence from the following (4 credits):  |  | <b>4</b>       |
| PHYS 1230G & PHYS 1230L  | Algebra-Based Physics I and Algebra-Based Physics I Lab  |                |
| PHYS 1310G & PHYS 1310L  | Calculus -Based Physics I and Calculus -Based Physics I Lab  |                |
| PHYS 2230G & PHYS 2230L  | General Physics for Life Science I and Laboratory to General Physics for Life Science I              |                |
| Choose one sequence from the following (4 credits):  |  | <b>4</b>       |
| PHYS 1240G & PHYS 1240L  | Algebra-Based Physics II and Algebra-Based Physics II Lab  |                |
| PHYS 1320G & PHYS 1320L  | Calculus -Based Physics II and Calculus -Based Physics II Lab  |                |
| PHYS 2240G & PHYS 2240L  | General Physics for Life Science II and Laboratory to General Physics for Life Science II            |                |
| Select 3-4 credits from the following:   |  | <b>3-4</b>     |
| C S 151  | C++ Programming  |                |
| C S 152  | Java Programming   |                |
| C S 153  | Python Programming I   |                |
| C S 158  | R Programming I  |                |
| C E 151  | Introduction to Civil Engineering  |                |
| GEOG 381   | Cartography and GIS  |                |
| MATH 1350G   | Introduction to Statistics   |                |
| MATH 2350G   | Statistical Methods  |                |
| <b>Second Language Requirement: (required- see below)</b>  |  |                |
| Select 8 credits from two semesters of a second language (see the section at the bottom of the page) |  | <b>8</b>       |
| <b>Electives, to bring to the total credits 120 <sup>5</sup></b>                                     |  | <b>7-11</b>    |
| <b>Total Credits</b>   |  | <b>121-120</b> |

<sup>1</sup> See the General Education (<https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/>) section of the catalog for a full list of courses

<sup>2</sup> \*For either Mathematics course selection students may need to take any prerequisites needed to enter the class(es) first.

<sup>3</sup> See the Viewing a Wider World (<https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext>) section of the catalog for a full list of courses

<sup>4</sup> May not be taken S/U and a grade of C- or better must be earned.

<sup>5</sup> Elective credit may vary based on Math course selection, second language requirements, prerequisites, dual credit, AP credit, double

majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Students must work closely with their advisors in order to plan programs that allow them to meet all requirements and earn sufficient upper-division credit.

## Second Language Requirement

For the Bachelor of Science in the Geology there is a one year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

### Option 1:

| Prefix  | Title   | Credits |
|---|---|---------|
| <b>Complete one of the following sequences:</b> |   |         |
| FREN 1110<br>& FREN 1120                        | French I<br>and French II   | 8       |
| GRMN 1110<br>& GRMN 1120                        | German I<br>and German II   | 8       |
| JAPN 1110<br>& JAPN 1120                        | Japanese I<br>and Japanese II   | 8       |
| SPAN 1110<br>& SPAN 1120                        | Spanish I<br>and Spanish II   | 8       |
| PORT 1110<br>& PORT 1120                        | Portuguese I<br>and Portuguese II   | 6       |
| <i>For Heritage Speakers:</i>                   |   |         |
| SPAN 1210<br>& SPAN 1220<br>or SPAN 2210        | Elementary Spanish for Heritage Learners I<br>and Spanish for Heritage Learners II<br>Spanish for Heritage Learners III | 6       |

### Option 2:

| Prefix   | Title                     | Credits |
|--|---------------------------|---------|
| <b>Complete the following sequence for American Sign Language (with a C- or better):</b> |                           |         |
| SIGN 1110  | American Sign Language I  | 3       |
| SIGN 1120  | American Sign Language II | 3       |

### Option 3:

| Prefix   | Title  | Credits |
|--|--|---------|
| <b>Challenge the 1120 level for the following courses:</b>           |  |         |
| FREN 1120<br>or GRMN 1120<br>or JAPN 1120<br>or SPAN 1120<br>OR      | French II<br>German II<br>Japanese II<br>Spanish II                                    | 4       |
| <b>Challenge the 1120/1220/2210 level for the following courses:</b> |  |         |
| PORT 1120<br>or SPAN 1220<br>or SPAN 2210                            | Portuguese II<br>Spanish for Heritage Learners II<br>Spanish for Heritage Learners III | 3       |

### Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

### Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

### Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

### Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

### Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

## A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1250G Trigonometry & Pre-Calculus and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

### First Year

| Semester 1   | Credits      |
|--|--------------|
| Area I: Communications - Level 1 Course                              | 4            |
| ENGL 1110G Composition I (Recommended) <sup>1</sup>                  |              |
| Area II: Mathematics Course <sup>1</sup>                             | 3-4          |
| MATH 1250G Trigonometry & Pre-Calculus (Recommended) <sup>2</sup>    |              |
| GEOL 1110G Physical Geology<br>or HNRS 2116G or Earth, Time and Life | 4            |
| Area IV: Social and Behavioral Science Course <sup>1</sup>           | 3            |
| <b>Credits</b>   | <b>14-15</b> |

### Semester 2

|   |              |
|---|--------------|
| CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors <sup>2</sup>                      | 4            |
| MATH 1430G Applications of Calculus I <sup>2</sup><br>or MATH 1511G or Calculus and Analytic Geometry I | 3-4          |
| Area I: Communications - Oral Communication Course  | 3            |
| COMM 1115G Introduction to Communication (Recommended)  |              |
| Area VI: Creative and Fine Arts Course <sup>1</sup>   | 3            |
| Elective Course <sup>3</sup>  | 1            |
| <b>Credits</b>  | <b>14-15</b> |

### Second Year

| Semester 1  | Credits |
|---|---------|
| GEOL 1150 Introduction to Rocks and Minerals  | 3       |
| GEOL 305V Fossils and the Evolution of Life   | 3       |
| CHEM 1225G General Chemistry II Lecture and Laboratory for STEM Majors <sup>2</sup> | 4       |

|  |   |              |
|--|---|--------------|
| MATH 1440<br>or MATH 1521G   | Applications of Calculus II <sup>2</sup><br>or Calculus and Analytic Geometry II      | 3-4          |
| Area I: Communications - Level 2 Course                                    |   | 3            |
| ENGL 2210G   | Professional and Technical Communication Honors (Recommended) <sup>1</sup>            |              |
| <b>Credits</b>   |   | <b>16-17</b> |
| <b>Semester 2</b>  |   |              |
| GEOL 312   | Mineralogy and Optics (Spring Only) <sup>2</sup>                                      | 3            |
| GEOL 420   | Stratigraphy and Sedimentology  | 3            |
| Choose one from the following:   |   | 3-4          |
| GEOG 381   | Cartography and GIS (Recommended to meet the 3-4 credit non-departmental requirement) |              |
| C S 151  | C++ Programming   |              |
| C S 152  | Java Programming  |              |
| C S 153  | Python Programming I  |              |
| C S 158  | R Programming I   |              |
| C E 151  | Introduction to Civil Engineering   |              |
| MATH 1350G   | Introduction to Statistics  |              |
| MATH 2350G   | Statistical Methods   |              |
| Area V: Humanities Course <sup>1</sup>                                     |   | 3            |
| Elective Course <sup>3</sup>   |   | 2            |
| <b>Credits</b>   |   | <b>14-15</b> |
| <b>Third Year</b>  |   |              |
| <b>Semester 1</b>  |   |              |
| GEOL 470   | Structural Geology <sup>2</sup>   | 3            |
| GEOL 360   | General Geochemistry  | 3            |
| Choose one sequence from the following:                                    |   | 4            |
| PHYS 1230G<br>& PHYS 1230L   | Algebra-Based Physics I<br>and Algebra-Based Physics I Lab <sup>2</sup>               |              |
| PHYS 1310G<br>& PHYS 1310L   | Calculus -Based Physics I<br>and Calculus -Based Physics I Lab <sup>2</sup>           |              |
| Geology Upper-Division Elective Course (refer to degree requirements list) |   | 3            |
| Elective course  |   | 2            |
| <b>Credits</b>   |   | <b>15</b>    |
| <b>Semester 2</b>  |   |              |
| GEOL 399   | Igneous and Metamorphic Petrology   | 3            |
| Choose one sequence from the following:                                    |   | 4            |
| PHYS 1240G<br>& PHYS 1240L   | Algebra-Based Physics II<br>and Algebra-Based Physics II Lab <sup>2</sup>             |              |
| PHYS 1320G<br>& PHYS 1320L   | Calculus -Based Physics II<br>and Calculus -Based Physics II Lab <sup>2</sup>         |              |
| Geology Upper-Division Elective Course (refer to degree requirements list) |   | 3            |
| VWW: Viewing a Wider World Course <sup>4</sup>                             |   | 3            |
| Elective course  |   | 2            |
| <b>Credits</b>   |   | <b>15</b>    |
| <b>Fourth Year</b>   |   |              |
| <b>Summer</b>  |   |              |
| GEOL 495   | Geology Field Camp <sup>5</sup>   | 4            |
| <b>Credits</b>   |   | <b>4</b>     |
| <b>Semester 1</b>  |   |              |
| VWW: Viewing a Wider World Course <sup>4</sup>                             |   | 3            |
| Geology Upper-Division Elective Course (refer to degree requirements list) |   | 3            |
| Geology Upper-Division Elective Course (refer to degree requirements list) |   | 3            |
| Elective Course  |   | 2            |

|   |  |                |
|---|--|----------------|
| First Course in Second Language Series  |  | 4              |
| <b>Credits</b>                          |  | <b>15</b>      |
| <b>Semester 2</b>                       |  |                |
| GEOL 490                                | Field Geology <sup>1,5</sup>                     | 3              |
| GEOL 491                                | Tectonic Evolution of North America <sup>1</sup> | 3              |
| GEOL 449                                | The Geological Profession <sup>1</sup>           | 1              |
| Second Course in Second Language Series |  | 4              |
| Elective course <sup>3</sup>            |  | 2              |
| <b>Credits</b>                          |  | <b>13</b>      |
| <b>Total Credits</b>                    |  | <b>120-124</b> |

- <sup>1</sup> See the General Education (<https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/>) section of the catalog for a full list of courses.
- <sup>2</sup> These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.
- <sup>3</sup> Students whose Financial Aid requires enrollment in at least 15 credits each semester, may need to take additional elective credit than what is listed. Students should discuss their electives with their advisor.  
\*Elective credit may vary based on Math course selection, second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis.
- <sup>4</sup> See the Viewing a Wider World (<https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext>) section of the catalog for a full list of courses.
- <sup>5</sup> GEOL 495 Geology Field Camp, is only taught in the summer of odd-numbered years. Students should take GEOL 490 Field Geology, during the spring semester before taking GEOL 495.  
GEOL 495 Geology Field Camp should be taken the summer after the third or fourth year. In cases where it is impossible to fit this class into a schedule, students may take a field camp at another university and transfer the credits. It is the student's responsibility to have the department head verify that the field camp is acceptable before taking the course.