

Geology

Department of Earth Sciences
Faculty of Science

This section presents the requirements for:

- **Geology – B.Sc. Honours**
- **Geology – B.Sc. General**
- **Computational Geophysics – B.Sc. Honours**
- **Geology and Physical Geography – B.Sc. Combined Honours**
- **Geology and Physical Geography with Concentration in Terrain Science – B.Sc. Combined Honours**
- **Biology and Geology– B.Sc. Combined Honours**
- **Chemistry and Geology– B.Sc. Combined Honours**
- **Minor in Earth Sciences**

Graduation Requirements

In addition to the requirements listed below, students must satisfy:

- i) the University regulations (see the *Academic Regulations of the University* section of this Calendar),
- ii) the Faculty regulations applying to all B.Sc. students including those relating to First-Year Seminar, Science Continuation and Breadth requirements (see the *Academic Regulations and Requirements for the Bachelor of Science Degree*).

Students should consult with the department, school or committee responsible for their program when planning their program and selecting courses.

Departmental Language Requirement

Most Honours and Combined Honours programs in Geology require that students meet the Departmental Language Requirement. This means that students must demonstrate, by passing an appropriate course or special examination, reading proficiency in a language other than English that is acceptable to the Department. This requirement must be satisfied before the student enrolls in 4000-level courses in Geology.

Course Categories for Geology Programs

The program descriptions below make use of the following course categories that are defined in the *Academic Regulations for the Bachelor of Science Degree* section of this Calendar.

- **Science Faculty Electives**
- **Advanced Science Faculty Electives**
- **Science Continuation Courses**
- **Science Geography**
- **Science Psychology**
- **Approved Arts or Social Science**
- **Free Elective**

Program Requirements

Geology

B.Sc. Honours (20.0 credits)

A. Credits Included in the Major CGPA (10.5 credits):

1. 1.0 credit from GEOL 1006, GEOL 1007 and GEOL 1008;
2. 3.5 credits GEOL 2203, GEOL 2205, GEOL 2208, GEOL 2301, GEOL 2306, GEOL 2801, GEOL 2802;

3. 3.0 credits in GEOL 3201, GEOL 3203, GEOL 3204, GEOL 3205, GEOL 3805 and GEOL 3806;
4. 1.0 credit in GEOL 4908 [1.0];
5. 2.0 credits in Geology at the 4000-level or above;

B. Credits Not Included in the Major CGPA (9.5 credits):

6. 1.0 credit in MATH 1007 and MATH 1107;
7. 1.0 credit in CHEM 1000 [1.0];
8. 1.0 credit in BIOL 1003 and BIOL 1004 or PHYS 1003 and PHYS 1004, or PHYS 1007 and PHYS 1008;
9. 1.0 credit in mathematics (MATH, STAT) or computer science (COMP) at the 2000-level or above;
10. 1.0 credit in Science Continuation Courses;
11. 1.0 credit in Science Faculty Electives;
12. 0.5 credits in NSCI 1000 or Approved Arts or Social Sciences elective;
13. 1.5 credits in Approved Arts or Social Sciences electives;
14. 1.5 credits in free electives;

C. Additional Non-Credit Requirement:

15. The departmental language requirement must be satisfied.

Geology with Concentration in Vertebrate Paleontology and Paleocology B.Sc. Honours (20.0 credits)

A. Credits Included in the Major CGPA (10.5 credits):

1. 0.5 credit in GEOL 1006 or GEOL 1007;
2. 3.0 credits in GEOL 1008, GEOL 2203, GEOL 2205, GEOL 2301, GEOL 2306, GEOL 2801;
3. 2.5 credits in GEOL 3201, GEOL 3805, GEOL 3111, GEOL 3112, GEOL 3113;
4. 0.5 credit in GEOL 4003 or GEOL 4808;
5. 1.0 credit in GEOL 4908 [1.0];
6. 3.0 credits from NSCI 1000, BIOL 3104, BIOL 3501, (BIOL 3601 or BIOL 3602), BIOL 3802, BIOL 3605, BIOL 4500, BIOL 4609, GEOG 3002, GEOG 3102, GEOG 3104, GEOL 2802, GEOL 3205, GEOL 4105, GEOL 4301;

B. Credits Not Included in the Major CGPA (9.5 credits):

7. 2.0 credits in BIOL 2001, BIOL 2104, BIOL 2600, STAT 2507;
8. 3.5 credits in BIOL 1003, BIOL 1004, CHEM 1000 [1.0], MATH 1007, MATH 1107, PHYS 1007;
9. 2.5 credits in Approved Arts or Social Sciences;
10. 1.5 credits in free electives.

Geology

B.Sc. General (20.0 credits)

A. Credits Included in the Major CGPA (10.5 credits):

1. 1.0 credit from GEOL 1006, GEOL 1007 and GEOL 1008;
2. 3.5 credits GEOL 2203, GEOL 2205, GEOL 2208, GEOL 2301, GEOL 2306, GEOL 2801, GEOL 2802;
3. 3.0 credits in GEOL 3201, GEOL 3203, GEOL 3204, GEOL 3205, GEOL 3805, GEOL 3806;

4. 3.0 credits in Geology at the 4000-level;

B. Credits Not Included in the Major CGPA (9.5 credits):

5. 1.0 credit in MATH 1007 and MATH 1107;
6. 1.0 credit in CHEM 1000 [1.0];
7. 1.0 credit in BIOL 1003 and BIOL 1004 or PHYS 1003 and PHYS 1004, or PHYS 1007 and PHYS 1008;
8. 1.0 credit in Science Faculty Electives;
9. 2.0 credits in Science Continuation Courses;
10. 0.5 credits in NSCI 1000 or Approved Arts or Social Sciences;
11. 1.5 credits in Approved Arts or Social Sciences;
12. 1.5 credits in free electives.

Geology

B.Sc. General (15.0 credits)

A. Credits Included in the Major CGPA (7.0 credits):

1. 1.0 credit from GEOL 1006, GEOL 1007 and GEOL 1008;
2. 3.0 credits GEOL 2203, GEOL 2205, GEOL 2208, GEOL 2301, GEOL 2306, GEOL 2801;
3. 3.0 credits in GEOL 3201, GEOL 3203, GEOL 3204, GEOL 3205, GEOL 3805, GEOL 3806;

B. Credits Not Included in the Major CGPA (8.0 credits):

4. 1.0 credit in MATH 1007 and MATH 1107;
5. 1.0 credit in CHEM 1000 [1.0];
6. 1.0 credit in (BIOL 1003 and BIOL 1004) or (PHYS 1003 and PHYS 1004), or (PHYS 1007 and PHYS 1008);
7. 2.0 credits in Science Continuation Courses;
8. 0.5 credits in NSCI 1000 or Approved Arts or Social Sciences;
9. 1.5 credits in Approved Arts or Social Sciences;
11. 1.0 credit in free electives.

Computational Geophysics

B.Sc. Honours (20.0 credits)

A. Credits Included in the Major CGPA (9.5 credits):

1. 1.5 credits in COMP 1005, COMP 1006, and COMP 2002;
2. 0.5 credit in Computer Science at the 2000-level or above;
3. 2.0 credits in CMPS 2800, CMPS 3800, and CMPS 4909 [1.0];
4. 0.5 credit in Computational Science (CMPS) at the 3000-level or above;
5. 1.0 credit from GEOL 1006, GEOL 1007 and GEOL 1008;
6. 4.0 credits in GEOL 2801, GEOL 2205, GEOL 2208, GEOL 3201, GEOL 3805, GEOL 3806, GEOL 4801, GEOL 4804;

Credits Not Included in the Major CGPA (10.5 credits):

7. 2.5 credits in MATH 1007, MATH 1107, MATH 2007, MATH 2008, STAT 2507;
8. 2.5 credits in PHYS 1001, PHYS 1002, PHYS 2202, PHYS 3807, PHYS 4203;
9. 0.5 credit in ELEC 3105;

10. 1.0 credit in CHEM 1000 [1.0];

11. 2.0 credits from GEOL 2203, GEOL 2301, GEOL 2802, GEOL 3203, GEOL 3204, GEOL 3205, GEOL 4203, GEOL 4707, GEOL 4805, PHYS 2604, PHYS 3604;

12. 0.5 credits in NSCI 1000 or Approved Arts and Social Sciences;

13. 1.5 credits in Approved Arts and Social Sciences.

Note: the courses in Requirement 10 above should be selected in consultation with the program adviser.

Geology and Physical Geography

B.Sc. Combined Honours (20.0 credits)

A. Credits Included in the Major CGPA (12.0 credits):

1. 1.0 credit in GEOL 1006 and GEOG 2100 (preferred), or GEOL 1007 or GEOG 1008;
2. 1.5 credits in GEOL 2203, GEOL 2205, GEOL 2208;
3. 2.0 credits in Geology (GEOL) at the 3000-level or above;
4. 1.0 credit in Geology (GEOL) at the 4000-level;
5. 0.5 credits in GEOG 2102;
6. 1.5 credit in Science Geography Courses at the 2000-level or above;
7. 2.0 credits in GEOG 3002, GEOG 3102, GEOG 3105, GEOG 3108;
8. 1.0 credit in Science Geography Courses at the 4000-level;
9. 1.0 credit in GEOG 4906 [1.0] or GEOL 4908 [1.0];

B. Credits Not Included in the Major CGPA (8.0 credits):

10. 2.0 credits in CHEM 1000 [1.0], MATH 1007 and MATH 1107;
11. 1.0 credit in PHYS 1003 and PHYS 1004, or PHYS 1007 and PHYS 1008;
12. 1.0 credit in Mathematics (MATH, STAT) at 2000-level or above; and/or in Computer Science (COMP); (STAT 2507 and COMP 1004 are recommended);
13. 0.5 credits in NSCI 1000 or Approved Arts or Social Sciences;
14. 1.5 credits in Approved Arts or Social Sciences;
15. 2.0 credits in free electives.
16. 0.5 credit in ENSC 2000.

Notes:

1. Students who have taken GEOL 1000 [1.0] (no longer offered) or any two of GEOL 1006, GEOL 1007 or GEOL 1008 may, with permission of the program advisers, substitute these courses for GEOL 1005 [1.0]/Geography GEOG 1005 [1.0].
2. A Human Geography course is recommended in the program.
3. The course ENSC 2000 precludes GEOG 2909.

Geology and Geography:

Concentration in Terrain Science

B.Sc. Combined Honours (20.0 credits)

A. Credits Included in the Major CGPA (12.5 credits):

1. 1.0 credit in GEOG 2100 and GEOL 1006 (preferred) or GEOL 1007 or GEOG 1008;
2. 2.0 credits in GEOL 2203, GEOL 2205, GEOL 2208, GEOL 2802;

3. 2.0 credit in GEOL 3201, GEOL 3203, GEOL 3205, GEOL 3806;
4. 1.0 credit in Geology at the 4000-level;
5. 0.5 credit in GEOG 2006 or STAT 2507;
6. 1.5 credits in GEOG 2004, GEOG 2007, GEOG 2101;
7. 2.0 credits in GEOG 3002, GEOG 3102, GEOG 3105, GEOG 3108;
8. 1.0 credit in GEOG 4101 and GEOG 4108;
9. 1.0 credit in GEOL 4908 [1.0] or GEOG 4906 [1.0];
10. 0.5 credit in ENSC 2000;

B. Credits Not Included in the Major CGPA (7.5 credits):

11. 1.0 credit in CHEM 1000 [1.0];
12. 1.0 credit in MATH 1007 and MATH 1107;
13. 1.0 credit in (PHYS 1003 and PHYS 1004) or (PHYS 1007 and PHYS 1008);
14. 0.5 credit from COMP 1003, COMP 1004 or COMP 1007;
15. 1.0 credit in Science Faculty Electives at the 2000-level or above;
16. 0.5 credits in NSCI 1000 or Approved Arts or Social Sciences;
17. 1.5 credits in Approved Arts or Social Sciences;
18. 1.0 credit free electives.

Biology and Geology**B.Sc. Combined Honours (20.0 credits)****A. Credits Included in the Major CGPA (13.0 credits):**

1. 1.0 credit in BIOL 1003 and BIOL 1004;
2. 1.0 credit in GEOL 1008 and either GEOL 1006 or GEOL 1007;
3. 10.0 credits in Biology (or Biochemistry) and Geology at the 2000-level or above, collectively satisfying:
 - a) 0.5 credit from BIOL 3605, BIOL 3606, GEOL 2801, GEOL 4807;
 - b) at least 4.0 credits are in Biology;
 - c) at least 4.0 credits are in Geology;
 - d) at least 4.0 credits are at the 3000-level or above;
4. 1.0 credit in BIOL 4908 or GEOL 4908;

B. Credits Not Included in the Major CGPA (7.0 credits):

5. 1.0 credit in MATH 1007 and MATH 1107;
6. 1.0 credit in CHEM 1000 [1.0], PHYS 1003 and PHYS 1004, or PHYS 1007 and PHYS 1008. The omitted subject, i.e. Chemistry or Physics, must have been taken at the OAC level;
7. 0.5 credit in Statistics (STAT). STAT 2507 is recommended;
8. 0.5 credit in Computer Science. COMP 1004 is recommended;
9. 1.0 credit in Science Faculty Electives;
10. 0.5 credits in NSCI 1000 or Approved Arts or Social Sciences;
11. 1.5 credits in Approved Arts or Social Sciences;
12. 1.0 credit in free electives;

C. Additional Non-Credit Requirement:

13. The Department of Earth Sciences language requirement must be satisfied.

Chemistry and Geology**B.Sc. Combined Honours (20.0 credits)****A. Credits Included in the Major CGPA (12.0 credits):**

1. 4.0 credits in CHEM 1000 [1.0], CHEM 2101, CHEM 2102, CHEM 2302, CHEM 2303, CHEM 3503, CHEM 3504;
2. 1.0 credit in Chemistry at the 4000-level;
3. 0.5 credit chosen from GEOL 1007, GEOL 1008;
4. 2.5 credits in GEOL 1006, GEOL 2203, GEOL 2205, GEOL 2208, GEOL 2801;
5. 1.0 credit in Geology at the 3000-level;
6. 1.0 credit in Geology at the 4000-level;
7. 1.0 credit in Chemistry or Geology;
8. 1.0 credit in either CHEM 4908 or GEOL 4908;

B. Credits Not Included in the Major CGPA (8.0 credits):

9. 1.5 credits in MATH 1007, MATH 1107, MATH 2007;
10. 0.5 credit in MATH or STAT at the 2000-level;
11. 1.0 credit in either (PHYS 1003 and PHYS 1004) or (PHYS 1007 and PHYS 1008);
12. 1.0 credit in Science Faculty Electives (not CHEM or GEOL);
13. 1.0 credit in Science Faculty Electives;
14. 0.5 credit in NSCI 1000 or Approved Arts or Social Sciences;
15. 1.5 credits in Approved Arts or Social Sciences;
16. 1.0 credit in free electives;

C. Additional Non-Credit Requirement:

17. The Department of Earth Sciences language requirement must be satisfied.

Minor in Earth Sciences

The Minor in Earth Sciences is available to degree students registered in programs other than those associated with the Department of Earth Sciences. Students, with appropriate OAC prerequisites and 1st year Earth Science credits, may choose courses to follow specific themes such as Earth History, Field Geology, Rocks and Minerals, Geology and the Environment, Geology of Natural Resources, and, Fossils: Their Identification, Environment and Applications. Consultation with the Undergraduate Co-ordinator is required.

Requirements:

1. 1.0 credit Earth Sciences at the 1000-level;
2. 3.0 credits in total from Earth Sciences.
3. The remaining requirements of the major discipline(s) and degree must be satisfied.