

MEMORIAL UNIVERSITY OF NEWFOUNDLAND
Department of Earth Sciences

Undergraduate Handbook: Outline of Programs Offered by the Department of Earth Sciences



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1. Welcome to Earth Sciences at Memorial University of Newfoundland and Labrador

Welcome to Earth Sciences at Memorial! This handbook provides some basic information about our programs and will assist you in course selection. Given that after graduation most Earth Science students will find themselves working as Professional Geoscientists, we have also included a section on professional registration, including course requirements. We encourage you to meet with our Manager of Academic Programs, located in the Department of Earth Sciences general office, for guidance and advice on navigating your program, choosing courses, requesting waivers, ensuring scholarship eligibility, applying to the Honours program, and meeting minimum academic requirements for professional registration

2. Programs in Earth Sciences

The material presented here is a distillation of the requirements for various programs as outlined in the university calendar; however, for full details and program regulations you should consult the current University Calendar: <https://www.mun.ca/regoff/calendar/sectionNo=SCI-1098>. If there is a discrepancy between this handbook and the University Calendar, the Calendar is to be taken as the official and accurate source of program regulations.

Available programs of study in Earth Sciences are:

- B.Sc. General Degree with Major in Earth Sciences
- B.Sc. (Honours) Degree with Major in Earth Sciences
- B.Sc. Joint Honours in Biology and Earth Sciences
- B.Sc. Joint Honours in Chemistry and Earth Sciences
- B.Sc. Joint Honours in Earth Sciences and Geography
- B.Sc. Joint Honours in Earth Sciences and Physics
- B.Sc. Joint Honours in Geophysics and Physical Oceanography
- B.Sc. Joint Major in Earth Sciences and Physics
- Minor in Earth Sciences

As an Earth Sciences major, you have the opportunity to customize your program to your interests, preferences, and goals. Here are some points to consider:

- During your third and fourth years, you can select courses from one of our career-oriented "streams", if you so choose. If you wish to ensure that you cover a wider breadth of disciplines within Earth Sciences, the Comprehensive stream is a good choice.
- Qualified students are encouraged to complete the Honours program as many employers view completion of a dissertation favourably, as it demonstrates an ability to engage in the scientific process and demonstrates ability to communicate results of a project.
- If you want to continue your studies at the graduate level, an Honours degree is required by many institutions.
- In order to qualify for [professional registration](#), most of our majors elect to follow an Honours program, or to choose five more EASC courses instead of five electives for a general B.Sc., depending on their academic standing.

With careful planning, within four years you can complete a General or Honours Earth Sciences program that prepares you for either graduate studies or employment. Some of our joint Honours programs may take longer than four years.

For detailed information about our B.Sc. Honours Degree in Earth Sciences, please consult the Department of Earth Sciences [Honours Handbook](#).

2.1 First Year: Preparation and Declaring a Major

To prepare for a major in Earth Sciences, 1000-level courses in English, Chemistry, Mathematics, and Physics, as well as Earth Sciences are required, for example:

Table 1. An example of what a first year schedule could look like.

FALL SEMESTER	WINTER SEMESTER
EASC 1000 Earth Systems	EASC 1002 Concepts & Methods in Earth Sciences
ENGL 1090 Critical Reading & Writing: Telling Stories	ENGL 1110 Critical Reading & Writing in Rhetoric
CHEM 1050 General Chemistry I (or CHEM 1010)	CHEM 1051 General Chemistry II (or CHEM 1050)
MATH 1000 Calculus I (or MATH 1090)	MATH 1001 Calculus II (or MATH 1000)
PHYS 1020 Introductory Physics I (or PHYS 1050)	PHYS 1021 Introductory Physics II (or PHYS 1051)

Depending on your specific situation, your schedule may be different than the above example, for instance:

- For Earth Sciences, you could take EASC 1000 in the Winter semester and EASC 1002 in the Intersession.
- Instead of English 1110, you can choose any designated Critical Reading and Writing (CRW) course offered by the Faculty of Humanities and Social Sciences.
- For Chemistry, you can take CHEM 1010 in the Fall semester, CHEM 1050 in the Winter semester, and CHEM 1051 in the Spring semester.
- For Mathematics, if you are placed in MATH 1090 in the Fall semester, you can take MATH 1000 in the Winter semester and MATH 1001 in the Spring semester, or in the following Fall semester without delaying your progress in the Earth Sciences program.
- For Physics, if you are interested in geophysics or want to take any higher-level Physics courses, you will need PHYS 1050 and 1051, or PHYS 1020 in the Fall semester, PHYS 1021 in the Winter semester, and PHYS 1051 in the Spring semester. If you obtain at least 70% in PHYS 1020, you can immediately register for PHYS 1051 (note: MATH 1001 is a pre- or co-requisite for PHYS 1051).

Declaring a Major

Once you have completed 3 credit hours in each of Chemistry, Earth Sciences, English, Math and Physics, you can declare a Major in Earth Sciences. To do this, complete the [Declaration/Change of Academic Program](#) form and request a meeting with the Manager of Academic Programs to declare the Major and discuss course selection.

To move on to the required 2000-level EASC courses, you must achieve a minimum grade of 55% in each of EASC 1000 and 1002.

2.2 Second Year: Foundation

The second year of the Major exposes students to numerous disciplines of the Earth Sciences and provides the basic framework for many subsequent courses in third and fourth year.

The second year of the program will help provide insight into whether you wish to focus on geology, environmental geoscience, or geophysics. Students interested in geology and environmental geoscience will have most prerequisites needed for third year Earth Sciences courses after completion of second year. Students interested in geophysics will need to ensure that they have completed the Mathematics and Physics prerequisites for certain third year courses in geophysics.

Tables 2 and 3 below are examples of course schedules for geology/environmental geoscience and geophysics, respectively.

A description of all courses offered by the Department of Earth Sciences can be found at this link to the University Calendar: <https://www.mun.ca/regoff/calendar/sectionNo=SCI-2273>.

Table 2. Example of a typical second year schedule for geology/environmental geoscience.*

FALL SEMESTER	WINTER SEMESTER
EASC 2030 Mineralogy	EASC 2031 Mineralogy & Petrography
EASC 2502 Introduction to Geochemistry	EASC 2401 Structural Geology
EASC 2702 Sedimentology & Stratigraphy	EASC 3905 Field Methods in Structural Geology & Stratigraphy**
EASC 2905 Introduction to Geological Mapping **	STAT 2550 Statistics for Science Students
BIOL 2120 Biology for Students of Earth Sciences	Science Elective
	Elective

*Example only. Your situation may require a different second year schedule.

**Field courses take place just before the semester and just after the Winter semester.

Table 3. Example of a typical second year schedule for geophysics.*

FALL SEMESTER	WINTER SEMESTER
EASC 2030 Mineralogy	EASC 2031 Mineralogy & Petrography
EASC 2502 Introduction to Geochemistry	EASC 2401 Structural Geology
EASC 2702 Sedimentology & Stratigraphy	EASC 3905 Field Methods in Structural Geology & Stratigraphy **
EASC 2905 Introduction to Geological Mapping **	PHYS 2055 Electricity & Magnetism
MATH 2000 Calculus III	Science Elective
	Elective

*Example only. Your situation may require a different schedule.

** Field courses take place just before the Fall semester and just after the Winter semester.

2.3 Third and Fourth Year: Streams

In the third and fourth years of the Earth Sciences Major, students may choose groups of courses that reflect their general interests - i.e. streams. The five potential streams in Earth Sciences, include:

- Geology Stream: Bedrock, Crust and Mantle
- Geology Stream: Surface Processes and Sedimentary Basins
- Environmental Geoscience Stream
- Geophysics Stream
- Comprehensive Stream

These streams are not official, nor will they appear on one's transcript, but are suggested to provide guidance for course selection based on the interests and/or career aspirations of the student. The exception is the geophysics stream, where students who take this stream must follow the courses as presented to satisfy the Geoscience Knowledge Requirements for registration as a Professional Geoscientist in Newfoundland and Labrador. Streams do not provide expertise, per se, this only comes from additional training in specific areas (e.g., at the MSc or PhD level) and from professional practice in a given area of expertise.

If you wish to register as a Professional Geoscientist with the [Professional Engineers and Geoscientists of Newfoundland and Labrador \(PEGNL\)](#), course selection should be guided by Geoscientists Canada [Geoscience Knowledge Requirements \(GKR\)](#), as PEGNL uses these guidelines for determining GKR for individuals wishing to register as a Geoscientist in Training or a Professional Geoscientist in the province. Courses should be chosen using the PEGNL academic requirements spreadsheet provided by the department and in consultation with the Manager of Academic Programs.

Descriptions of all courses offered by the Department of Earth Sciences can be found in the University Calendar here: <https://www.mun.ca/regoff/calendar/sectionNo=SCI-2273>.

2.3.1 Geology Stream: Bedrock, Crust and Mantle

The Bedrock, Crust and Mantle Geology Stream focuses on the composition and evolution of Earth's crust and mantle, including development of crystalline rocks, crustal-scale igneous, metamorphic, and hydrothermal processes, mineral deposit genesis, and the effects of plate tectonics on the structure and chemistry of the crust and mantle. Students will study field geology, structural geology and tectonics, mineralogy, igneous and metamorphic petrology, geochemistry, and exploration geophysics, and learn how these are integrated and used in the classification, origin, and search for mineral deposits. In this stream you can expect to acquire the skills needed to understand the formation of crystalline (igneous and metamorphic) rocks and their application to the analysis of mineral deposits and their geologic settings. You will also gain an understanding of the environmental aspects of mineral resources exploitation.

This stream prepares one for employment in mineral exploration and development, in government geological surveys (e.g., bedrock mapping and the distribution, management and regulation of mineral resources) while providing students with a solid background for employment in related fields (e.g., energy resources) and potential further studies at the graduate level.

2.3.2 Geology Stream: Surface Processes and Sedimentary Basins

The Surface Processes and Sedimentary Basins Geology Stream focuses on Earth surface processes driven by gravity, tectonics, and climate, including uplift, subsidence, weathering, erosion, sediment transport and deposition. Students will study physical sedimentology, clastic and carbonate sedimentology, paleontology, stratigraphy, sediment provenance, structural geology, field geology, petrology, diagenesis, sedimentary environments, and the tectonic setting and evolution of sedimentary basins. The stream will also provide training on the stratigraphic methods and geochemical tools for dating and correlating stratified sediment and sedimentary rocks. Students will also become familiar with a variety of remote geophysical methods, such as seismic reflection and downhole petrophysical logs, and common whole rock, mineral, and isotopic geochemical techniques used in sedimentary basin analysis. This stream prepares one for careers related to Earth surface processes and sedimentary basins, including work related to modern and ancient continental and oceanic sedimentary environments and their deposits. Sectors of potential employment include the energy industry, mineral exploration and mining, marine geosciences, geological survey bedrock mapping and environmental and geotechnical sectors.

2.3.3 Environmental Geoscience Stream

The Environmental Geoscience Stream focuses on how humans are changing the rate of natural processes, the impacts of those changes, and how to mitigate those impacts for sustainability while supporting Earth's growing population. This stream builds on foundational knowledge of geologic processes and prepares students to think critically and creatively in solving environmental problems. Students in this stream can study environmental geology, hydrogeology, geographical information systems (GIS), environmental geophysics, groundwater modelling, field techniques, and global change, etc. This stream prepares students for careers in environmental consulting, research, education and outreach, government, as well as being the environmental specialist in mining, and oil and gas companies. This stream is appropriate for students who intend on applying for [professional registration](#) through PEGNL's Environmental Geoscience registration.

2.3.4 Geophysics Stream

The Geophysics Stream focuses on using physics to investigate subsurface geoscience problems at all scales from shallow geotechnical/environmental targets, to exploration for energy resources and mineral deposits, to studies in plate tectonics, to whole Earth structure and dynamics. In this stream, students will learn about and employ the various geophysical methods used to explore the subsurface, will study their geologic context with an emphasis on physical properties, structures and tectonics, and will acquire an appropriate background in physics and mathematics. Students completing the Geophysics Stream will be prepared for employment in a wide variety of geoscience enterprises, including the search for natural resources (oil and gas, minerals, groundwater, and others) or subsurface environmental or geotechnical investigations. This stream also provides a solid foundation for graduate work for those interested in further training or an academic career.

Note that 3000- and 4000-level geophysics courses have prerequisites from the Department of Physics and Physical Oceanography and the Department of Mathematics and Statistics. The sequence of courses in this stream is very closely coordinated and requires careful scheduling to avoid delays in completing your program.

If you are planning a career in geophysics, you may wish to consider a Joint Major or Joint Honours in Earth sciences and Physics. Both of these programs can be designed to satisfy the requirements for [professional registration](#).

2.3.5 Comprehensive Stream

The Comprehensive Stream is intended to provide a more personalized and diverse selection of courses representative of a broad spectrum of Earth Sciences sub-disciplines (Figure 1). Exploring topics from the deep Earth to the Earth's surface will allow students to obtain a B.Sc. in Earth Sciences with a broad background. Many Earth Science students select this stream when they are interested in more than one of the above streams. This stream will provide students with a customizable breadth of knowledge applicable to all of the same employment sectors as the other streams. As with the other streams, [professional registration](#) can be achieved with this stream provided course selection is in agreement with professional registration guidelines.

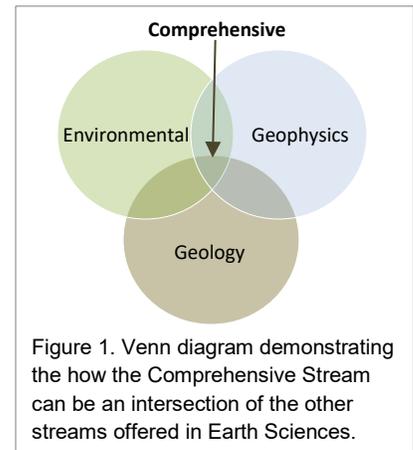


Figure 1. Venn diagram demonstrating the how the Comprehensive Stream can be an intersection of the other streams offered in Earth Sciences.

2.4 Minors and Electives

A **Minor** consists of at least 24 credit hours in a specific subject area that is different than the Major and that is formally noted on a student's transcript upon graduation. It is not a requirement of a General Degree or Honours B.Sc., but can be taken with either degree. If a student chooses not to complete a Minor, they must complete electives so as to achieve the minimum 120 credit hours required for the degree. Minor programs are offered by the Faculty of Business Administration, the Faculty of Humanities and Social Sciences, the Faculty of Science, and the School of Music. If choosing to complete a Minor, please consult with an advisor in that program who will assist you in selecting appropriate courses for that Minor program.

A Minor in Chemistry, Physics, Biology, Math, Statistics, Oceanography, or Geography are all considered complimentary to an Earth sciences major. However, depending on a student's interests and goals, a minor in any other field, such as French, Business, or Music, may be just as suitable.

Electives are courses that can be taken to fulfil the minimum credit hours required for the degree, but are not otherwise specified in that degree program. If a student chooses not to complete a Minor, they must complete a minimum of 24 credit hours (usually eight courses) in electives for the B.Sc. Honours Degree or a minimum of 39 credit hours (usually 13 courses) in electives for the General Degree of B.Sc. in Earth Sciences. Please note that should a student wish to be eligible for [professional registration](#) with PEGNL upon graduation, students completing the General Degree of B.Sc. in Earth Sciences will only have 24 credit hours in electives, as the other 15 credit hours must be chosen as per the PEGNL Geoscience Knowledge Requirements.

Electives for the B.Sc. degree in Earth Sciences can be taken in any discipline, at any level, and from any faculty or school at Memorial.

The Department of Earth Sciences offers a number of courses that any student at Memorial can take as electives toward their degree (Table 4). These "service" courses usually do not have prerequisites or associated laboratory sections and are designed for a broad audience, including students majoring in Arts, Business Administration, Education, Engineering, etc., as well as students majoring in other science disciplines. Students completing a Major in Earth Sciences can take these courses, but they will be considered electives and do not count towards the Major. Only EASC 2919 can be used by students completing a Minor in Earth Sciences.

Table 4. Earth Sciences Service Courses.

Service course	Prerequisites
EASC 2150 The Solar System	None
EASC 2916 Natural Hazards on a Dynamic Earth	None
EASC 2917 Gems: the Science and Politics	None
EASC 2918 Earth's Story	None
EASC 2919 Introduction to Marine Geology	EASC 1000 with minimum 55%

2.5 Checklists

CHECKLIST: B.Sc. (Honours), Major in Earth Sciences

First Year

CHEM 1050 _____ AND CHEM 1051 _____
EASC 1000 _____ AND EASC 1002 _____ (with 55% in both)
ENGL 1090 _____ AND Critical Reading & Writing (CRW) course _____
MATH 1000 _____ AND MATH 1001 _____
PHYS 1020 and 1021 _____ OR PHYS 1050 and 1051 _____

Second Year

EASC 2030 _____, 2031 _____, 2401 _____, 2502 _____, 2702 _____, 2905 _____, 3905 _____
MATH 2000 _____ or STAT 2550 _____
BIOL 2120 _____ (or BIOL 1001 AND BIOL 1002 _____) or PHYS 2055 _____ AND PHYS 2820 _____
^{1,3}Six credit hours from Faculty of Science at the 2000 level or higher _____, _____

Third and Fourth Year

EASC 3420 _____
²15 credit hours in EASC @ 3000 or 4000 level _____, _____, _____, _____, _____
²12 credit hours in EASC @ 4000 level _____, _____, _____, _____
EASC 499A/B _____, _____

Electives

³Additional electives so as to achieve 120 credit hours (this would normally be eight courses, but may be more or less depending on your choices above) _____, _____, _____, _____, _____, _____, _____, _____

NOTES:

1. Credit hours from Earth Sciences courses, BIOL 3811, BIOL 4800, OCSC 2200, GEOG 3150, and GEOG 4150 are excluded. However, PHYS 2820 is permitted.
2. EASC 4950 cannot be used to fulfil this requirement
3. Three credit hours of the science or general electives must be from Biology, Chemistry, Computer Science, Statistics or Physics. They may be from Mathematics only if MATH 2000 has not been taken to fulfill the program requirement above of one of MATH 2000 or STAT 2550.

Academic Standing

Overall degree GPA of at least 2.75 _____

EASC Major average minimum 75% (not including 1000/1002/service courses) _____

OR

No grade less than 65% in EASC Major courses (not including 1000/1002/service courses) _____

A maximum of three repeats or substitutions of EASC Major courses are permitted to achieve this standing: _____, _____, _____. Core courses cannot be substituted, rather must be repeated.

***This is not an official audit and is based on University Regulations.
An official audit can only be provided by the Office of the Registrar.***

CHECKLIST: B.Sc. (General), Major in Earth Sciences

NOTE: Completion of this program will NOT result in academic eligibility for [professional registration](#) with PEGNL, unless electives are chosen to fulfill PEGNL Geoscience Knowledge Requirements.

First Year

CHEM 1050 ____ AND CHEM 1051 ____
EASC 1000 ____ AND EASC 1002 ____ (with 55% in both)
ENGL 1090 ____ AND Critical Reading & Writing (CRW) course ____
MATH 1000 ____ AND MATH 1001 ____
PHYS 1020 and 1021 ____ OR PHYS 1050 and 1051 ____

Second Year

EASC 2030 ____, 2031 ____, 2401 ____, 2502 ____, 2702 ____, 2905 ____, 3905 ____
MATH 2000 ____ or STAT 2550 ____
BIOL 2120 ____ (or BIOL 1001 AND BIOL 1002 ____) or PHYS 2055 ____ AND PHYS 2820 ____
¹Six credit hours from Faculty of Science at the 2000 level or higher _____, _____

Third and Fourth Year

EASC 3420 ____
²9 credit hours in EASC @ 3000 or 4000 level _____, _____, _____
²9 credit hours in EASC @ 4000 level _____, _____, _____

Electives

^{3,4}Additional electives so as to achieve 120 credit hours (this would normally be thirteen courses, but may be more or less depending on your choices above) _____, _____, _____, _____,
_____, _____, _____, _____, _____, _____, _____, _____, _____

NOTES:

1. Credit hours from Earth Sciences courses, BIOL 3811, BIOL 4800, OCSC 2200, GEOG 3150, and GEOG 4150 are excluded. However, PHYS 2820 is permitted.
2. EASC 4950 and EASC 499A/B cannot be used to fulfil this requirement
3. To be eligible for professional registration, five of these electives must be chosen from section 2C on the PEGNL spreadsheet which can be found on the departmental website.
4. If both BIOL 1001 and 1002 OR both PHYS 2055 and 2820 were not completed above, then one 3 credit hour elective will have to be a course offered by the Faculty of Science to ensure 78 hours in science are completed.

Academic Standing

Overall degree GPA of at least 2.00 in the 120 credit hours required for the degree ____

Minimum GPA of 2.00 in EASC major courses ____

Minimum GPA of 2.00 in the 78 science credit hours required for the degree ____

***This is not an official audit and is based on University Regulations.
An official audit can only be provided by the Office of the Registrar.***

3. Joint Major and Honours Programs

A Joint Major or Joint Honours entails studying two separate fields for a single degree. The choice of a joint program depends on a student's personal and career interests. Joint degrees may provide a broader undergraduate education and skill set beyond Earth Sciences, which may open up alternative career opportunities. However, students should be aware that it may result in less flexibility and options with course selection, potential conflicts when registering for courses across majors, and possibly additional time to completion for a student's program.

There is one joint Major program available with Earth Sciences, and five joint Honours programs:

- B.Sc. Joint Major in Earth Sciences and Physics
- B.Sc. Joint Honours in Biology and Earth Sciences
- B.Sc. Joint Honours in Chemistry and Earth Sciences
- B.Sc. Joint Honours in Earth Sciences and Geography
- B.Sc. Joint Honours in Earth Sciences and Physics
- B.Sc. Joint Honours in Geophysics and Physical Oceanography

All of the joint programs with Earth Sciences require the standard 120 credit hours, except the Joint Honours in Biology and Earth Sciences, which requires 135 credit hours. The Joint Honours in Biology and Earth Sciences will take a minimum of four and a half to five years to complete.

Regulations for our Joint Major program can be found at this link:

<https://www.mun.ca/regoff/calendar/sectionNo=SCI-4166>

Regulations for our Joint Honours programs can be found at this link:

<https://www.mun.ca/regoff/calendar/sectionNo=SCI-2624>

The most commonly completed joint program with Earth Sciences is the B.Sc. Joint Honours in Earth Sciences and Geography, as there is considerable intellectual and content overlap between these disciplines.

A joint program with Biology allows a student to examine the relationships between past or present life on Earth, and geological, oceanic and atmospheric processes. A joint program with Chemistry allows a student to examine the matter of which Earth and other bodies in the solar system are made, and how they change.

Geochemists study the abundances of the elements in minerals, soils, rocks, and ores, as well as in water and the atmosphere. Biogeochemists specialize in the study of how life, chemistry, and the Earth affect each other. This includes the study of cycles in the Earth, such as the carbon cycle.

Joint programs in these fields will position students for careers in climate change, water security and resource management, geohazards, Arctic science and protection, sustainable mineral and energy development, the search for new energy resources, planetary science, and so much more.

Completion of a joint program does not guarantee eligibility for [professional registration](#). If a student wishes to be eligible for registration, they must choose courses to ensure that they meet PEGNL Geoscience Knowledge Requirements, and course selection should be done in consultation with the Manager of Academic Programs.

4. Minor in Earth Sciences

A Minor in Earth Sciences includes 24 credit hours as follows:

1. Earth Sciences 1000 and 1002 with a minimum 55% in each.
2. Eighteen credit hours chosen from Earth Sciences courses at the 2000 level or higher with at least 5 credit hours from courses at the 2000 level. Credit hours from Earth Sciences 2150, 2311, 2914, 2915, 2916, 2917, 2918, 4310 and 4950 cannot be used to fulfil this requirement.

First year science courses in Math, Chemistry, Physics and Biology are prerequisites for most Earth Sciences courses at the 2000 level or higher that can be counted toward the Minor. However, with careful selection and planning, a Minor can be completed even if a student has limited first year Math and sciences. Second year Earth Sciences credits are pre-requisites for many 3000 level and above courses in Earth Sciences.

To be eligible to declare a Minor in Earth Sciences, students must complete EASC 1000 with a minimum of 55%, complete the Declaration/Change of Academic Program form, and request a meeting with the Manager of Academic Programs to declare the Minor and discuss course selection.

To be awarded a Minor in Earth Sciences, a student must obtain a minimum GPA of 2.00 in the 24 credit hours required for the Minor, assuming all regulations and course requirements are met.

5. Transfer Courses

The Registrar's Office coordinates transfer credit evaluation for Undergraduate applicants, as well as for current or returning Memorial University students. For information on how to transfer credits, or for permission to take courses at another university for transfer to Memorial, please follow this link:

<https://www.mun.ca/regoff/records/transfer-credits/>.

It is important to note that use of transfer courses towards a degree program is subject to the University's residence requirements as described below.

Consult with the Manager of Academic Programs before you complete equivalent courses at another institution to determine the applicability of course(s) towards your university degree and whether one will meet Memorial's residence requirements.

6. Residence Requirements

University general regulations pertaining to all degree programs:

<https://www.mun.ca/regoff/calendar/sectionNo=REGS-0508>

First Degree

1. More than half of the total credit hours required for the degree shall consist of the following:
 - Courses taken at Memorial University.
 - Courses taken at universities and/or colleges which are included in formal institutional exchange agreements with Memorial University.
 - Courses taken at Francophone universities, as required under specific degree program regulations.

2. Students who have taken courses in the subject(s) of their Major at another university are required to complete more than half of the total credit hours in each of their Major subjects at Memorial University.

Second Degree

To obtain a second Bachelor's degree, the student shall complete at least 30 credit hours at Memorial University beyond those required for the first degree. These credit hours must be applicable to the degree sought. Students who have completed a first degree at Memorial University may be permitted to take up to 6 of the 30 credit hours required in this clause at another university.

University regulations pertaining to B.Sc. degree programs:

<https://www.mun.ca/regoff/calendar/sectionNo=SCI-4341>

<https://www.mun.ca/regoff/calendar/sectionNo=SCI-4352>

<https://www.mun.ca/regoff/calendar/sectionNo=SCI-4379>

1. At least 15 credit hours in courses from each Major subject at the 3000-level or above must be completed at Memorial University.

2. Students who have taken courses appropriate to their Minor at another university are required to complete at least 6 credit hours in courses from the Minor subject at Memorial University.

3. Not more than 15 unspecified transfer credit hours awarded in subject areas not taught at Memorial University shall be used to satisfy the requirements of the degree.

4. To qualify for an Honours Degree of Bachelor of Science, a student shall attend a recognized university or an equivalent institution for at least seven semesters as a full-time student. Students transferring credits to Memorial University of Newfoundland from other universities or equivalent institutions shall either:

- spend a minimum of four of the seven semesters as full-time students at Memorial University and take a minimum of 24 credit hours in courses from their Major subject(s) from this university; or
- spend fewer than four of the seven semesters as full-time students at Memorial University of Newfoundland and take a minimum of 36 credit hours in courses from their Major subject(s) from this university.

7. Graduation Requirements – Academic Standing

Assuming that all regulations and program requirements are met, to graduate with a General Degree of B.Sc., the following academic standing must be achieved:

- obtain a minimum GPA of 2.00 in the 120 credit hours required for this degree; and
- obtain a minimum GPA of 2.00 in the 45 credit hours required for the Earth Sciences Major; and
- obtain a minimum GPA of 2.00 in the 78 credit hours of science courses required for this program.

Assuming that all regulations and program requirements are met, to graduate with a B.Sc. Honours Degree, the following academic standing must be achieved:

- obtain a minimum GPA of 2.75 in the 120 credit hours required for this degree; and
- obtain a minimum grade of 65% in each Earth Sciences Major course, excluding first year and service courses, OR obtain a minimum average of 75% in those courses.

A student can repeat or substitute up to three times to achieve this standing. Core courses cannot be substituted, but rather must be repeated.

To be awarded a Minor in Earth Sciences, assuming that all regulations and course requirements are met, a student must obtain a minimum GPA of 2.00 in the 24 credit hours required for the Minor.

8. Forms

The following forms can be found at this link: <https://www.mun.ca/regoff/forms/>

- Declaration/Change of Academic Program
- Course Change Form
- Request for Program Advice Form
- Application for Honours Program
- Letter of Permission to Transfer Courses from Another Institution

9. Professional Registration

Individuals who wish to enter the Geoscience profession will require registration in a regulatory agency. Within the province that agency is the Professional Engineers and Geoscientists of Newfoundland and Labrador (PEGNL) and registration with this entity is a requirement for anyone that practices geoscience in any capacity, including teaching. Registration involves a Geoscience Knowledge Requirement (GKR), experience and competency requirement obtained through employment (+/- graduate study), and an ethical requirement (i.e., a professional practice and ethics examination). The Geoscience Knowledge Requirements are obtained through completion of a Bachelor's degree (+other degrees) in Earth Sciences. The GKR provides three pathways to obtaining the knowledge requirements: Geology, Environmental Geoscience, and Geophysics. PEGNL uses the GKR as outlined by Geoscientists Canada, which requires a certain *number* and *content* of courses. It is the responsibility of all interested students to plan their programs carefully to ensure they meet all these GKR.

A B.Sc. Honours degree from Memorial includes a sufficient *number* of Earth Sciences Major courses for professional registration. However, a B.Sc. General degree as outlined in the Calendar is insufficient for professional registration because it does not contain enough Major courses in Earth Sciences. B.Sc. General students can reach the required number of courses for registration by selecting five electives to add sufficient Earth Sciences (and/or specific Geography/Physics/Math) courses to a General B.Sc. degree. While taking the required number of courses is necessary, it does not guarantee eligibility for professional registration, as the GKR also requires a certain content of Earth Sciences courses.

To assist with ensuring compliance with PEGNL's GKR, a spreadsheet has been created for students to evaluate their courses and progress towards obtaining the GKR needed for registration in one of the pathways above. Students who intend to register with PEGNL, or who wish to be eligible to register, should use this checklist and follow these requirements when choosing courses. The spreadsheet can be found at this link: <https://www.mun.ca/earthsciences/undergraduates/professional-registration/>. Students are also encouraged to meet with the Manager of Academic Programs who can assist in selecting courses so that students meet the academic requirements for professional registration.

To learn more about professional registration, please visit [Geoscientists Canada](#) and [PEGNL](#). Undergraduate students who plan on working in the geoscience profession should also read [Geoscientists-in-training \(GIT\) program guide](#).

Please note that the above are professional requirements and that students must first ensure they meet the academic requirements for their BSc degree as set out in the University Calendar by Memorial University.