Bachelor of Arts and Science

Programs, Courses and University Regulations

2012-2013

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This publication provides guidance to prospects, applicants, students, faculty and staff.

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2. In the interpretation of academic regulations, the Senate is the final authority.
3. Students are responsible for informing themselves of the University's procedures, policies and regulations, and the specific requirements associated with the degree, diploma, or certificate sought.
4. All students registered at McGill University are considered to have agreed to act in accordance with the University procedures, policies and regulations.
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Note: Throughout this publication, "you" refers to students newly admitted, readmitted or returning to McGill.

Publication Information

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Not all courses are offered every year and changes can be made after publication. Always check the Minerva Class Schedule link at https://banweb.mcgill.ca/pban1/bwckschd.p_disp_dyn_sched for the most up-to-date information on whether a course is offered.

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1 About the Faculties

The B.A. & Sc. is an interdisciplinary degree intended for students who want to pursue simultaneously a program offered by Arts and one offered by Science. The B.A. & Sc. is intended for students with well-defined interdisciplinary interests, and is not meant as a "compromise" between a B.A. and a B.Sc. degree. If you are more interested in Arts, but would like to study some Science, you can do so within the B.A. degree. Similarly, if you are more interested in Science, but would like to study some Arts, you can do so within the B.Sc. degree.

To learn more about the Faculty of Arts, see *Programs, Courses and University Regulations > Faculties & Schools > Faculty of Arts > The Faculty > : About the Faculty of Arts*. To learn more about the Faculty of Science, see *Programs, Courses and University Regulations > Faculties & Schools > Faculty of Science > The Faculty > : About the Faculty of Science*.

2 Programs and Teaching in Arts and in Science

Programs and teaching in Arts are described under *Programs, Courses and University Regulations > Faculties & Schools > Faculty of Arts > The Faculty > : Programs and Teaching in Arts*. Those in Science are described under *Programs, Courses and University Regulations > Faculties & Schools > Faculty of Science > The Faculty > : Programs and Teaching in Science*. The two faculties jointly offer the B.A. & Sc., so students pursuing that degree are at home in both Arts and Science.

3 About the Bachelor of Arts and Science (Undergraduate)

The B.A. & Sc. is an interdisciplinary degree intended for students who want to pursue simultaneously a program offered by Arts and one offered by Science. The B.A. & Sc. is intended for students with well-defined interdisciplinary interests, and is not meant as a "compromise" between a B.A. and a B.Sc. degree. If you are more interested in Arts, but would like to study some Science, you can do so within the B.A. degree. Similarly, if you are more interested in Science, but would like to study some Arts, you can do so within the B.Sc. degree.

3.1 Location

853 Sherbrooke Street West
Montreal, Quebec H3A 0G5
Canada

Telephone: 514-398-5442
Faculty websites: *www.mcgill.ca/arts* and *www.mcgill.ca/science*
Degree website: *www.mcgill.ca/science/sousa/new_students*

Science Office for Undergraduate Student Advising (SOUSA)
Website: *www.mcgill.ca/science/student*

The Science Office for Undergraduate Student Advising (SOUSA) of the Faculty of Science and the Office of the Director of Advising Services of the Faculty of Science are located in Dawson Hall. SOUSA serves students in the B.A. & Sc. and B.Sc. degrees.

3.2 Administrative Officers

For a listing of administrative officers in the Faculty of Arts, refer to *Programs, Courses and University Regulations > Faculties & Schools > Faculty of Arts > Undergraduate > : Administrative Officers* and for those in the Faculty of Science, refer to *Programs, Courses and University Regulations > Faculties & Schools > Faculty of Science > Undergraduate > : Administrative Officers*. Note that the Director of Advising Services, Science, is responsible for students pursuing a B.A. & Sc.

The B.A. & Sc. Program Administration Committee (PAC), which oversees the curriculum and regulations for the degree, consists of the following members:

B.A. & Sc. Program Administration Committee (PAC)	
Laurie Hendren; B.Sc., M.Sc.(Qu.), Ph.D.(C'nell)	**Chair; Associate Dean (Academic) Faculty of Science**

B.A. & Sc. Program Administration Committee (PAC)	
Nicole Allard; B.A.(W. Ont.), M.A.(Guelph), M.Ed.(McG.)	**Adviser to the Committee; Director of Advising Services (SOUSA)**
Bruce A. Arndtsen; B.A.(Car. College), Ph.D.(Stan.)	**Chemistry**
Gabriella Coleman; B.A.(Col.), M.A., Ph.D.(Chic.)	**Program Director; Art History & Communication Studies**
Gillian Lane-Mercier; B.A., M.A.(Univ. de Montpellier), Ph.D. (McG.)	**Associate Dean (Academic), Faculty of Arts**
Louis Lefebvre; B.Sc., M.A., Ph.D.(Montr.)	**Biology**
Tobias Rees; Magister Artium(Eberhard Karls-Universität Tübingen), Diploma Neuroplasticity(Institute Pasteur, Paris, France), Ph.D.(Calif., Berk.)	**Social Studies of Medicine**
Stéfan Sinclair; B.A.(Br. Col.), M.A.(Vic., BC), Ph.D.(Qu.)	**Languages, Literatures, and Cultures**
Malek Yalaoui; B.A.(McG.)	**Administrative Coordinator, Faculty of Science, Dean's Office**
Student representatives (2)	**B.A. & Sc. Program**

3.3 Science Office for Undergraduate Student Advising (SOUSA)

The Science Office for Undergraduate Student Advising (SOUSA) provides ongoing advice and guidance on academic issues related to programs, degree requirements, registration, course change, withdrawal, deferred exams, supplemental exams, academic standing, inter- and intra-faculty transfer, year or term away, transfer credits, second programs, second degrees, and graduation.

Every student in the B.A. & Sc. degree is assigned an adviser in SOUSA. The adviser's name appears near the top of your Advising Transcript on Minerva. You can contact your adviser directly, or if you do not yet have a SOUSA adviser, email *adviser.science@mcgill.ca*.

SOUSA advisers provide assistance with degree planning and are a valuable referral source. They are a good place to start if you are not sure where to address your question. They also offer help managing academic situations during periods of personal, financial, or medical problems, by working with you to identify various possibilities and strategies for making informed decisions.

Special requests can be made, in writing, to the Director of Advising Services, Science, who is responsible for students pursuing a B.A. & Sc.

The Committee on Student Standing (CSS) of the Faculty of Science will consider appeals of the Director of Advising Services' decisions. For information about CSS, see the Director of Advising Services' assistant.

For more information, refer to *www.mcgill.ca/science/student*.

4 Degree Admission Requirements

For information about admission requirements to the B.A. & Sc., refer to the *Undergraduate Admissions Guide*, found at *www.mcgill.ca/applying*.

For information about interfaculty or inter-degree transfers, refer to *University Regulations and Resources > Undergraduate > Registration > : Interfaculty Transfer*, as well as to the relevant information posted on the Science Office for Undergraduate Student Advising (SOUSA) website at *www.mcgill.ca/science/student/general*.

5 Degree Requirements

Each student pursuing a B.A. & Sc. must be aware of the regulations as stated in this section of this publication and on the McGill and Science Office for Undergraduate Student Advising (SOUSA) websites.

While departmental and Faculty advisers and staff are always available to give advice and guidance, the ultimate responsibility for completeness and correctness of course selection and registration, for compliance with, and completion of, program and degree requirements, and for the observance of regulations and deadlines *rests with you*. It is your responsibility to seek guidance from the SOUSA Office if in any doubt; misunderstanding or misapprehension will not be accepted as cause for dispensation from any regulation, deadline, program, or degree requirement.

To be eligible for a B.A. & Sc., you must fulfil all Faculty degree and program requirements as indicated below:

section 5.1: Minimum Credit Requirement
section 5.2: Residency Requirement

Programs, Courses and University Regulations > University Regulations and Resources > Undergraduate > Student Records > : Grading and Grade Point Averages (GPA)
section 5.3: Time and Credit Limit for Completion of the Degree
section 5.6: Course Requirements

5.1 Minimum Credit Requirement

You must complete the minimum credit requirement for the degree as specified in your letter of admission.

Students are normally admitted to a four-year degree requiring the completion of 120 credits, but advanced standing of up to 30 credits may be granted if you obtain satisfactory results in the Diploma of Collegial Studies, International Baccalaureate, French Baccalaureate, Advanced Levels, and Advanced Placement tests.

If you are readmitted after interrupting your studies for a period of five consecutive years or more, you may be required to complete a minimum of 60 credits and satisfy the requirements of a program. In this case, a new GPA will be calculated. The Director of Advising Services, Science, in consultation with the appropriate department, may approve a lower minimum for students who had completed 60 credits or more before interrupting their studies.

If you are readmitted after a period of absence, you are normally subject to the program and degree requirements in effect at the time of readmission.

5.2 Residency Requirement

To obtain a B.A. & Sc., you must satisfy the following residency requirements: a minimum of 60 credits of courses used to satisfy the B.A. & Sc. requirements must be taken and passed at McGill, exclusive of any courses completed as part of the math and science requirements of the B.A. & Sc. Freshman program. At least two-thirds of all departmental program requirements (Multi-track, Honours, Interfaculty) must normally be completed at McGill, not including courses completed in a prior McGill degree. Exceptionally, students in major concentrations or interfaculty or honours programs who pursue an approved Study Away or Exchange program may, with prior approval from both their department and the Director of Advising Services, Faculty of Science, be exempted from the two-thirds rule. In addition, some departments may require that their students complete specific components of their program at McGill.

5.3 Time and Credit Limit for Completion of the Degree

If you need 96 or fewer credits to complete your degree requirements, you are expected to complete your degree in no more than eight terms after your initial registration. If you are a student in the Freshman program, you become subject to these regulations one year after your initial registration. If you need or want to exceed this time limit, you must receive permission from the Director of Advising Services, Science, to continue your studies.

If you are registered in the B.A. & Sc., you are expected to complete the requirements of your program and your degree within 120 credits. You will receive credit for all courses (subject to degree regulations) taken up to and including the semester in which you obtain 120 credits. If you want to remain at McGill beyond that semester, you must also seek permission of the Director of Advising Services, Science. Permission for exceeding the time and/or credit limits will normally be granted only for valid academic reasons, such as a change of program (subject to departmental approval) and part-time status. If permission is granted, you will receive credit only for required and complementary courses necessary to complete program requirements.

5.4 Bachelor of Arts and Science (B.A. & Sc.) - Freshman Program (30 credits)

Students who need to complete 97-120 credits to fulfil their degree requirements are admitted to the Freshman Program. Students with specific career goals should consult an academic adviser about their choice of program within the B.A. & Sc. However, students intending to pursue further studies following the B.A. & Sc. should refer to the admissions requirements of particular programs for the appropriate prerequisite courses.

In particular, students should note the following:

- The minimum freshman science requirements in the B.A. & Sc. may not satisfy the introductory science requirements of all medical/dental schools.

- The Major Concentration in Psychology may not provide a sufficiently focused background for admission to many graduate programs in Psychology.

- The Major Concentration Chemistry is not certified by the Ordre des Chimistes du Québec. Students interested in pursuing a career in Chemistry in Quebec are advised to take an appropriate B.Sc. program in Chemistry.

For further details, refer to information about the B.A. & Sc. Freshman Program on the website at http://www.mcgill.ca/science/sousa/new_students/.

Foundational Courses

The Freshman Program requirements include foundational courses in both Science and Arts which must be selected as follows:

MATH

At least two mathematics courses:

One of a first Calculus:

MATH 139	(4)	Calculus 1 with Precalculus
MATH 140	(3)	Calculus 1
MATH 150	(4)	Calculus A

One of a second Calculus:

MATH 141	(4)	Calculus 2
MATH 151	(4)	Calculus B

A Linear Algebra course:

MATH 133	(3)	Linear Algebra and Geometry

SCIENCE

At least three foundational science courses:

One or more of Biology or Chemistry:

* Note: CHEM 120 is not open to students who have taken CHEM 115.

BIOL 111	(3)	Principles: Organismal Biology
BIOL 112	(3)	Cell and Molecular Biology
CHEM 120*	(4)	General Chemistry 2

One of General Chemistry:

CHEM 110	(4)	General Chemistry 1
CHEM 115	(4)	Accelerated General Chemistry: Giants in Science

One of Mechanics:

PHYS 101	(4)	Introductory Physics - Mechanics
PHYS 131	(4)	Mechanics and Waves

One of Electromagnetism:

Note: PHYS 101 is a prerequisite for PHYS 102; and PHYS 131 is a prerequisite for PHYS 142.

PHYS 102	(4)	Introductory Physics - Electromagnetism
PHYS 142	(4)	Electromagnetism and Optics

ARTS

At least three Arts courses (or 9 credits) to be chosen in two of the following three categories: Humanities, Languages and Social Sciences.

A maximum of two courses (or 6 credits) may be chosen from one category, and no more than two courses (or 6 credits) can be taken in any one department.

Note: No course may fulfil the requirements for more than one program, including the B.A. & Sc. Freshman Program.

Humanities (Literature and Civilization):

Courses selected from the following subjects:

- Art History and Communications Studies (ARTH and COMS)

- Classics (CLAS)
- East Asian Studies (EAST)
- English (ENGL)
- French Language and Literature (FREN)
- German Studies (GERM)
- Hispanic Studies (HISP)
- Islamic Studies (ISLA)
- Italian studies (ITAL)
- Jewish Studies (JWST)
- Philosophy (PHIL)
- Religious Studies (RELG)
- Russian Studies (RUSS)

Languages:

Courses may be taken in this category to improve language skills.

Languages include:

- Classics (Latin, Ancient Greek or Modern Greek) (CLAS)
- East Asian Studies (Chinese, Japanese, Korean) (EAST)
- English as a Second Language (CEAP, CESL)
- French as a Second Language (FRSL)
- French Language and Literature (FREN)
- German Studies (GERM)
- Hispanic Studies (Spanish) (HISP)
- Islamic Studies (Arabic, Persian, Turkish, Urdu) (ISLA)
- Italian (ITAL)
- Jewish Studies (Hebrew, Yiddish) (JWST)
- Russian and Slavic Studies (Polish, Russian, Armenian, Czech) (RUSS)

Social Sciences:

Courses selected from the following subjects:

- Anthropology (ANTH)
- Economics (ECON)
- History (HIST)
- Linguistics (LING)
- Political Science (POLI)
- Sociology (SOCI)

Advanced Standing/Transfer Credits

Students who have completed the Diploma of Collegial Studies, Advanced Placement exams, Advanced Levels, the International Baccalaureate, the French Baccalaureate, or McGill placement examinations may receive exemption and/or credit for all or part of the Mathematics and foundational science courses as well as exemption from all or part of the Arts courses requirement of the Freshman Program. Similarly, students who have completed courses at other universities or colleges may receive exemptions and/or credits.

Advanced Placement Examination results with a score of 4 or 5 must be declared by the student at the time of initial registration at the University.

For more information about advanced standing, please consult: http://www.mcgill.ca/students/transfercredit/. Students must carefully select their mathematics and science Freshman courses so that they have all the required prerequisites for their intended departmental programs.

5.5 Departmental Programs

If you are pursuing a B.A. & Sc., other than those registered in the Freshman program, you are required to have an approved program (multi-track, honours, joint honours, interfaculty), and to select your courses in each term with a view to timely completion of your degree and program requirements. You must complete one of the program streams described below.

Previously the degree included a **required integrative course (BASC 201; 3 credits)**. However, as of January 2011 this is no longer the case, and the course is currently under review. Students must still select a **complementary integrative course (3 credits)** within or outside a student's programs selected from the list of complementary Integrative Courses (see *section 9.6: Integrative Courses*), plus electives (10–15 credits).

5.5.1 Multi-Track System

To recognize the diversity of student backgrounds and interests and the multiple routes to understanding provided by a modern university, the Faculties of Arts and of Science offer a 90-credit multi-track system that includes a major concentration in one faculty complemented by either a major concentration or two minors/minor concentrations in the other faculty and that may be completed in one of the following ways:

Options

- Arts Major Concentration (36 credits) + Science Major Concentration (36–38 credits) (see *section 9: Overview of Programs Offered* for a list of programs open to students in the B.A. & Sc.)
- Major Concentration in Arts or Science (36–38 credits) + two minors/minor concentrations in the other faculty (2 x 18 credits = 36 credits)

Regulations

- Programs offered by Computer Science, Mathematics and Statistics, and Psychology are considered Science programs for the purpose of the B.A. & Sc.
- Within both options, all concentrations must be in different academic units. Thus, you may take a Geography program either in Arts or in Science, but not in both.
- Students will include within the 36 or 18 credits of their major concentrations or minors or minor concentrations any university-level (200 or above) prerequisites to required courses within their programs.
- No course may fulfil the requirements for more than one program.

Definitions

- *Units:* academic departments or administrative equivalents
- *Programs:* lists of required and complementary courses (including university-level prerequisites for required courses) prepared and maintained by units.
- *Major Concentration:* a program of 36–38 credits taken from a unit's course offerings
- *Minor Concentration:* a program of 18 credits taken from a unit's course offerings. Expandable minor concentrations are those that can, on the completion of 18 additional approved credits, be expanded into a major concentration within the appropriate unit.

5.5.2 Honours Program

Honours programs demand a high degree of specialization, and require you to satisfy specific departmental and Faculty Honours requirements while maintaining good Academic Standing. They are designed to prepare you for graduate study. Students in the B.A. & Sc. who complete an approved honours program must also complete an approved minor concentration or a minor in the Faculties of Arts or of Science. You must complete at least 30 credits in the Faculty of Arts and at least 30 in the Faculty of Science as part of your honours program and your minor concentration or minor program. See *section 9.3: Honours Programs* for a list of available programs.

To choose the Honours option, you must meet the GPA/CGPA requirements set out in *Programs, Courses and University Regulations > University Regulations and Resources > Undergraduate > Graduation > : Graduation Honours: Honours and First-Class Honours for Faculties of Arts and Science (including B.A. & Sc.)*.

5.5.3 Joint Honours Program

If you want to study at the honours level in two disciplines, you can combine a joint honours program component from an Arts discipline with one from a Science discipline; see *section 9.4: Joint Honours Programs* for a list of available programs. Each joint honours component consists of a maximum of 36–38 required and complementary credits (not including program prerequisites). In cases where a minimum of 24 credits are in courses normally restricted to Honours students, the total of required and complementary credits may be as few as 30.

To choose the Joint Honours option, you must meet the GPA/CGPA requirements set out in *Programs, Courses and University Regulations > University Regulations and Resources > Undergraduate > Graduation > : Graduation Honours: Honours and First-Class Honours for Faculties of Arts and Science (including B.A. & Sc.)*.

5.5.4 Interfaculty Program

An interfaculty program is an approved selection of courses constituting a concentration in an intellectually coherent and interfaculty field of studies. These courses must include approved selections from the Faculties of Arts and of Science and possibly other faculties. See *section 9.2: Interfaculty Programs* for a list of approved programs. Students in the B.A. & Sc. who complete an approved interfaculty program must also complete an approved minor concentration or a minor in the Faculties of Arts or of Science. You must complete at least 30 credits in the Faculty of Arts and at least 30 in the Faculty of Science as part of your interfaculty program and your minor concentration or minor program.

5.6 Course Requirements

All required and complementary courses used to fulfil program requirements, including the Freshman program, must be completed with a grade of C or better. If you fail to obtain a satisfactory grade in a required course, you must either pass the supplemental examination in the course or do additional work for a supplemental grade, if these options are available, or repeat the course. Course substitution will be allowed only in special cases; students should consult their academic adviser.

Normally, you are permitted to repeat a failed course only once. (Failure is considered to be a grade of less than C or the administrative failures of J and KF.) If a required course is failed a second time, you must appeal to the Director of Advising Services, Science, for permission to take the course a third time. If permission is denied by the Director of Advising Services and/or by the Committee on Student Standing of the Faculty of Science, on appeal, you must withdraw from the program. If the failed course is a complementary course required by the program, you may choose to replace it with another appropriate complementary course. If you choose to substitute another complementary course for a complementary course in which a D was received, credit for the first course will still be given, but as an elective. If you repeat a required course in which a D was received, credit will be given only once.

Full details of the course requirements for all programs as well as the locations of departmental advisory offices, program directors, and telephone numbers for further information are available as follows:

For a list of all programs available to B.A. & Sc. students, see *section 9: Overview of Programs Offered*.

For a list of complementary integrative courses, see *section 9.6: Integrative Courses*.

5.6.1 Course Overlap

You will not receive additional credit toward your degree for any course for which you have already received credit at McGill, CEGEP, at another university, or as a result of Advanced Placement, Advanced Level, International Baccalaureate, or French Baccalaureate exams. It is your responsibility to consult the Science Office for Undergraduate Student Advising (SOUSA) or the department offering the course as to whether or not credit can be obtained and to be aware of exclusion clauses specified in the course description in this publication.

Please refer to the following website for specific information about Advanced Standing credits and McGill course exemptions: *www.mcgill.ca/students/transfercredit*.

Sometimes two different departments offer the same course. Such courses are called "double-prefix" courses. When such courses are offered simultaneously, you should take the course offered by the department in which you are obtaining your degree. For example, in the case of double-prefix courses CHEM XYZ and PHYS XYZ, Chemistry students take CHEM XYZ and Physics students take PHYS XYZ. If different departments offer a double-prefix course in alternate years, you may take whichever course best fits your schedule.

Credit for computer science and statistics courses will be given with the stipulations specified under *Programs, Courses and University Regulations > Faculties & Schools > Faculty of Science > Undergraduate > Faculty Degree Requirements > Course Requirements >: Course Overlap*.

5.6.2 Courses Outside the Faculties of Arts and of Science

The following regulations apply to students in the B.A. & Sc. who want to take courses outside the Faculties of Arts and of Science:

- Regardless of your minimum credit requirement towards your B.A. & Sc., you are allowed a maximum of 12 credits in ELECTIVE and/or COMPLEMENTARY courses taken in faculties other than the Faculties of Arts and of Science.
- Students in certain designated programs that include a number of REQUIRED and COMPLEMENTARY courses in other faculties are permitted a maximum of 30 credits outside the Faculties of Arts and of Science. These programs are the Interfaculty and Honours programs in Environment, the Minor concentration in Environment, the Interfaculty program in Sustainability, Science and Society, and the Major concentration in Geography (Urban Systems).
- Any courses taught at McGill University may be used toward the maximum allowed, except for courses taught by the School Continuing Studies, for which you receive credits only in Continuing Studies. Courses taught by the McGill Writing Centre are excluded from this rule and can count for credit in your degree (see the SOUSA website for a list of approved courses: *www.mcgill.ca/science/student/continuingstudents/basc/conted*).
- For the purpose of this policy, courses taught in other faculties and specifically listed in *Programs, Courses and University Regulations > Faculties & Schools > Faculty of Arts > Undergraduate* or *Programs, Courses and University Regulations > Faculties & Schools > Faculty of Science > Undergraduate* are considered as courses taught in the Faculties of Arts and of Science.
- **The maximum number of credits allowed will be strictly enforced.**

5.6.3 Distance Education Courses

- A maximum of 6 credits of courses taught through distance education may be used as electives toward the B.A. & Sc. degree at McGill.
- Courses taught through distance education from institutions other than McGill will be approved as transfer credits under the following conditions:
  - the course is given by a government-accredited, degree-granting institution acceptable to McGill;
  - the course counts for credit toward degrees granted at the institution giving the course;
  - prior approval for the course is obtained from the Science Office for Undergraduate Student Advising (SOUSA).
- The combined total of regular course credits and distance education course credits may not exceed the permitted maximum number of credits per term according to the regulations for the B.A. & Sc. (see *Programs, Courses and University Regulations > University Regulations and Resources > Undergraduate > Registration > : Course Load*).
- Courses taught through distance education may not be used to complete program requirements, except on an individual basis when serious, documented circumstances warrant it. In such cases, prior approval must be obtained from your program adviser and the Director of Advising Services, Science.

5.6.4 Courses in English as a Second Language (ESL)

ESL courses are only open to students whose primary language is not English and who have studied for fewer than five years in English-language secondary institutions. As a student in the B.A. & Sc., you may take a maximum of 12 credits, including academic writing courses for non-anglophones, from the list of ESL courses published at *www.mcgill.ca/science/student/continuingstudents/basc/conted*.

5.6.5 Registration for First-Year Seminars

Registration for First-Year Seminars is limited to students in their first year of study at McGill, i.e., newly admitted students in U0 or U1. These courses are designed to provide a closer interaction with professors and better working relations with peers than is available in large introductory courses. These seminars endeavour to teach the latest scholarly developments and expose participants to advanced research methods. Registration is on a first-come, first-served basis. The maximum number of students in any seminar is 25, although some are limited to even fewer than that.

You may take only one First-Year Seminar during your first year at McGill. If you register for more than one, you will be obliged to withdraw from all but one of them.

A list of First-Year Seminars is available in *Programs, Courses and University Regulations > Faculties & Schools > Faculty of Arts > Undergraduate > Faculty of Arts Degree Requirements > Course Requirements >: First-Year Seminar Courses* and *Programs, Courses and University Regulations > Faculties & Schools > Faculty of Science > Undergraduate > Faculty of Science Degree Requirements > Course Requirements > : Registration for First-Year Seminars*.

6 Advising

If you need 96 or fewer credits to complete your degree requirements, you must consult an academic adviser in your proposed department of study to obtain advice and approval of your course selection (please see *Departmental Programs*). To facilitate program planning, you must present your transcript(s) and letter of admission. If you have not fulfilled the B.A. & Sc. Freshman program requirements, you should also seek advice from an adviser in the Science Office for Undergraduate Student Advising (SOUSA). For a detailed description of advising and registration procedures, you should refer to *Programs, Courses and University Regulations > University Regulations and Resources > Undergraduate > : Undergraduate Advising*, to *Programs, Courses and University Regulations > University Regulations and Resources > Undergraduate > : Registration*, and to the website for newly admitted undergraduate students at *www.mcgill.ca/newstudents*, as well as to the information posted on the SOUSA website at *www.mcgill.ca/science/student*, and the departmental websites.

If you need 97–120 credits to complete your degree requirements, you will normally be registered in a Freshman program until you complete your first year. You must consult an adviser in the Science Office for Undergraduate Student Advising (SOUSA) to obtain advice and approval of your course selection. For a detailed description of advising and registration procedures, you should refer to the website for newly admitted undergraduate students at *www.mcgill.ca/newstudents*, and to the information on the SOUSA website, *www.mcgill.ca/science/student*.

Advising for all returning students takes place in March for the upcoming academic year. For more information, you should refer to the SOUSA website, *www.mcgill.ca/science/student*.

6.1 Choosing a B.A. & Sc. Program

The B.A. & Sc. is intended for students with well-defined interdisciplinary interests. There are several options for the main program, all of which specify 75–80 of the 90 credits, leaving only 10–15 credits for electives. Since there are relatively few electives, students entering a program in the B.A. & Sc. degree should have a clear idea of their objectives, goals, and intended areas of study, so that they can plan their curriculum carefully.

It should be noted that there also exists considerable flexibility within the B.A. (Faculty of Arts) and B.Sc. (Faculty of Science) programs. If you are more interested in Arts, but would like to study some Science, you can do so within the B.A. degree. Similarly, if you are more interested in Science, but would like to study some Arts, you can do so within the B.Sc. degree. For example, B.Sc. students may complete minor concentrations in Arts and vice versa.

There are four ways to complete programs in the B.A. & Sc. degree:

Multi-track System

The multi-track system is intended for students who want a program that includes significant components from both Arts and from Science.

You complete 36 credits of Arts, 36–38 credits of Science, and 3 credits of integrative courses. You can either combine an Arts major concentration with a Science major concentration (36–38 credits) or you can select a major concentration from one faculty and two 18-credit minor concentrations from the other. Additional guidelines for the multi-track system can be found in *section 5.5: Departmental Programs*. You will find the program descriptions for the major and minor concentrations in Science which are unique to the B.A. & Sc. within this section of this publication.

Descriptions of programs offered in Arts are located under *Programs, Courses and University Regulations > Faculties & Schools > Faculty of Arts > Undergraduate*.

Interfaculty Programs

Interfaculty programs are interdisciplinary in nature. There are currently three such programs: Environment, Cognitive Science as well as Sustainability, Science and Society. In these programs, you complete 54 credits of the Interfaculty program, a minor of 18 credits, and 3 credits of integrative courses. You must complete at least 30 credits in the Faculty of Arts and at least 30 credits in the Faculty of Science as part of your interfaculty program and your minor concentration or program.

Environment

The growth of technology, globalization of economies, and rapid increases in population and per capita consumption have all had dramatic environmental impacts. The Faculty program in Environment for the Bachelor of Arts and Science is designed to provide students with a broad “Liberal Arts/Science” training. In combination with careful mentoring, this program offers a great degree of flexibility, allowing students to develop the skills and knowledge base required to face the myriad of environmental problems that currently need to be addressed. Further information about Environment programs and academic advising can be found at *www.mcgill.ca/mse*.

Cognitive Science

The Interfaculty program in Cognitive Science offered within the B.A. & Sc. degree is the only major program currently offered at McGill for students interested in this discipline. The requirements encourage you to choose courses in two of the five subject areas in Cognitive Science (Computer Science, Linguistics, Neuroscience, Philosophy, Psychology) as the focus of your program. In addition, if you are interested in research in this field, you may include up to 12 credits of research courses within your program. Further information can be found at *www.mcgill.ca/cogsci*.

Sustainability, Science and Society

Food security, access to clean water, poverty, climate change, biodiversity loss, sustainable energy production—a long list of challenges face human societies in the 21st century. In the face of these multiple challenges, the grand imperative of the 21st century is Sustainable Well-being—in other words, how can we provide for a world population that could stabilize at 9–10 billion, while also maintaining the Earth’s life support systems. Find out more about this interdisciplinary program at *www.geog.mcgill.ca/SSS/index.html*.

Joint Honours

The Joint Honours option is similar to the multi-track system except that you complete two joint honours components, one in Arts and one in Science. Currently, the choice of Science component is restricted to either Math or Psychology. However, there is a great range of choices for the Arts component.

To choose the Joint Honours option, you must meet the GPA/CGPA requirements set out in *Programs, Courses and University Regulations > University Regulations and Resources > Undergraduate > Graduation > : Graduation Honours: Honours and First-Class Honours for Faculties of Arts and Science (including B.A. & Sc.)*.

Honours

There are two B.A. & Sc. Honours programs. The Honours program in Environment is similar to the Interfaculty program in Environment but has additional GPA requirements and an additional 6-credit required research course. Likewise, the Honours program in Cognitive Science is similar to the Interfaculty program in Cognitive Science with additional GPA requirements and an additional 6-credit research course requirement. If you are completing an honours program, you must also complete a minor concentration or program, and 6 credits of integrative courses. You must complete at least 30 credits in the Faculty of Arts and at least 30 credits in the Faculty of Science as part of your honours program and your minor concentration or program.

To choose the Honours option, you must meet the GPA/CGPA requirements set out in *Programs, Courses and University Regulations > University Regulations and Resources > Undergraduate > Graduation > : Graduation Honours: Honours and First-Class Honours for Faculties of Arts and Science (including B.A. & Sc.)*.

6.2 Preparation for Graduate School

Any choice of undergraduate degree and program constrains options for graduate school. The B.A. & Sc. provides good preparation for graduate degrees in integrated disciplines such as Cognitive or Environmental Science as well as in the new Sustainability, Science and Society program. Depending on the Arts or Science specific program you want to enter in graduate school, the B.A. & Sc. may or may not be adequate preparation. If you intend to pursue an Arts or Science specific program at the graduate level, you should consult academic advisers in that discipline at McGill and at universities where you intend to apply in order to find out whether the B.A. & Sc. will prepare you adequately. If you are considering continuing on in a specific Science graduate program, you should examine the difference between the preparation provided by the 36-credit major concentrations in the B.A. & Sc. program versus the significantly more specialized major and honours programs offered in the B.Sc. programs.

7 Freshman Interest Groups

Freshman Interest Groups (FIGs) are groups of approximately 15 U0 students in the B.Sc. or B.A. & Sc., led by a professor in the Faculty of Science or Faculty of Medicine and an upper-year undergraduate student. They meet once every two weeks in the Fall semester to discuss a wide range of topics, such as science in the news, program choices, undergraduate research opportunities, or just aspects of life in Montreal. The purpose of a FIG is to ease the transition to McGill and Montreal and to provide you an opportunity to interact with a professor and with other U0 students in a small group. FIGs carry no credit and there is no charge. For more information and to see how to register, refer to *www.mcgill.ca/science/student/fig*.

8 Examinations

You should see *Programs, Courses and University Regulations > University Regulations and Resources > Undergraduate > : Examinations: General Information* for information about final examinations and deferred examinations.

The exam schedules are posted on the McGill website, *www.mcgill.ca/students/exams*, normally one month after the start of classes for the tentative Examination Schedule, and two months after the start of classes for the final Examination Schedule.

Students are warned not to make travel arrangements to leave Montreal prior to the scheduled end of any examination period.

9 Overview of Programs Offered

- *Major concentrations*; see *section 9.1: Major Concentrations*
- *Interfaculty programs*; see *section 9.2: Interfaculty Programs*
- *Honours programs*; see *section 9.3: Honours Programs*
- *Joint honours programs*; see *section 9.4: Joint Honours Programs*
- *Minor concentrations or minors*; see *section 9.5: Minor Concentrations or Minors*
- *Integrative courses*; see *section 9.6: Integrative Courses*

9.1 Major Concentrations

9.1.1 Faculty of Arts

Since the B.A. & Sc. degree requires a certain number of credits in the Arts and in the Sciences, there are special requirements for B.A. & Sc. students. To be counted as an Arts major concentration, the program must include at least 30 credits of Arts courses. Similarly, to be counted as a Science major concentration, the program must include at least 30 credits of Science courses.

For example, a student completing the 36-credit African Studies Major concentration in Arts must complete at least 30 of those credits in Arts courses and at most 6 credits in Science courses.

The Arts major concentrations available to B.A. & Sc. students listed below are described in detail under *Programs, Courses and University Regulations > Faculties & Schools > Faculty of Arts > Undergraduate > : Academic Programs*.

Faculty of Arts Major Concentrations

African Studies – *: Bachelor of Arts (B.A.) - Major Concentration African Studies (36 credits)*

Faculty of Arts Major Concentrations

Anthropology – *: Bachelor of Arts (B.A.) - Major Concentration Anthropology (36 credits)*

Art History – *: Bachelor of Arts (B.A.) - Major Concentration Art History (36 credits)*

Canadian Studies – *: Bachelor of Arts (B.A.) - Major Concentration Canadian Studies (36 credits)*

Classics – *: Bachelor of Arts (B.A.) - Major Concentration Classics (36 credits)*

East Asian Studies – *: Bachelor of Arts (B.A.) - Major Concentration East Asian Studies (36 credits)*

Economics – *: Bachelor of Arts (B.A.) - Major Concentration Economics (36 credits)*

English – Cultural Studies – *: Bachelor of Arts (B.A.) - Major Concentration English - Cultural Studies (36 credits)*

English – Drama and Theatre – *: Bachelor of Arts (B.A.) - Major Concentration English - Drama and Theatre (36 credits)*

English – Literature – *: Bachelor of Arts (B.A.) - Major Concentration English - Literature (36 credits)*

Geography – *: Bachelor of Arts (B.A.) - Major Concentration Geography (37 credits)*

Geography (Urban Systems) – *: Bachelor of Arts (B.A.) - Major Concentration Geography (Urban Systems) (36 credits)*

German Language and Literature – *: Bachelor of Arts (B.A.) - Major Concentration German Studies - Language and Literature (36 credits)*

German Literature and Culture – *: Bachelor of Arts (B.A.) - Major Concentration German Studies - Literature and Culture (36 credits)*

German Studies, Contemporary – *: Bachelor of Arts (B.A.) - Major Concentration Contemporary German Studies (36 credits)*

Hispanic Languages – *: Bachelor of Arts (B.A.) - Major Concentration Hispanic Studies - Languages (36 credits)*

Hispanic Literature and Culture – *: Bachelor of Arts (B.A.) - Major Concentration Hispanic Studies - Literature and Culture (36 credits)*

History – *: Bachelor of Arts (B.A.) - Major Concentration History (36 credits)*

International Development Studies – *: Bachelor of Arts (B.A.) - Major Concentration International Development Studies (36 credits)*

Italian Studies – *: Bachelor of Arts (B.A.) - Major Concentration Italian Studies (36 credits)*

Jewish Studies – *: Bachelor of Arts (B.A.) - Major Concentration Jewish Studies (36 credits)*

Langue et littérature françaises – Études et pratiques littéraires – *: Bachelor of Arts (B.A.) - Concentration majeure langue et littérature françaises - Études et pratiques littéraires (36 crédits)*

Langue et littérature françaises – Traduction – *: Bachelor of Arts (B.A.) - Concentration majeure langue et littérature françaises - Traduction (36 crédits)*

Latin-American Studies – *: Bachelor of Arts (B.A.) - Major Concentration Latin American Studies (36 credits)*

Linguistics – *: Bachelor of Arts (B.A.) - Major Concentration Linguistics (36 credits)*

Middle East Studies – *: Bachelor of Arts (B.A.) - Major Concentration Middle East Studies (36 credits)*

North American Studies – *: Bachelor of Arts (B.A.) - Major Concentration North American Studies (36 credits)*

Philosophy – *: Bachelor of Arts (B.A.) - Major Concentration Philosophy (36 credits)*

Philosophy and Western Religions – *: Bachelor of Arts (B.A.) - Major Concentration Philosophy and Western Religions (36 credits)*

Political Science – *: Bachelor of Arts (B.A.) - Major Concentration Political Science (36 credits)*

Quebec Studies – *: Bachelor of Arts (B.A.) - Major Concentration Quebec Studies / La concentration Majeur en Études sur le Québec (36 credits)*

Russian – *: Bachelor of Arts (B.A.) - Major Concentration Russian (36 credits)*

Scriptures and Interpretations – *Religious Studies (RELG) > : Bachelor of Arts (B.A.) - Major Concentration Scriptures and Interpretations (36 credits)*

Sociology – *: Bachelor of Arts (B.A.) - Major Concentration Sociology (36 credits)*

Women's Studies – *: Bachelor of Arts (B.A.) - Major Concentration Women's Studies (36 credits)*

World Religions – *: Bachelor of Arts (B.A.) - Major Concentration World Religions (36 credits)*

9.1.2 Faculty of Science

The Science major concentrations available to B.A. & Sc. students listed here are described in detail either under *Programs, Courses and University Regulations > Faculties & Schools > Bachelor of Arts & Science > Undergraduate > section 10: Academic Programs* (AS) or under *Programs, Courses and University Regulations > Faculties & Schools > Faculty of Arts > Undergraduate > : Academic Programs* (A).

Faculty of Science Major Concentrations

Biology – Cell/Molecular Option (AS) – *section 10.2.3: Bachelor of Arts and Science (B.A. & Sc.) - Major Concentration Biology - Cell/Molecular (36 credits)*

Biology – Organismal Option (AS) – *section 10.2.4: Bachelor of Arts and Science (B.A. & Sc.) - Major Concentration Biology - Organismal (37 credits)*

Chemistry (AS) – *section 10.4.1: Bachelor of Arts and Science (B.A. & Sc.) - Major Concentration Chemistry (36 credits)*

Computer Science (A) – *: Bachelor of Arts (B.A.) - Major Concentration Computer Science (36 credits)*

Earth, Atmosphere and Ocean Sciences (AS) – *section 10.7.1: Bachelor of Arts and Science (B.A. & Sc.) - Major Concentration Earth, Atmosphere and Ocean Sciences (36 credits)*

Geography – Physical Geography Option (AS) – *section 10.9.2: Bachelor of Arts and Science (B.A. & Sc.) - Major Concentration Geography - Physical Geography (36 credits)*

Mathematics (A) – *: Bachelor of Arts (B.A.) - Major Concentration Mathematics (36 credits)*

Physics (AS) – *section 10.11.1: Bachelor of Arts and Science (B.A. & Sc.) - Major Concentration Physics (36 credits)*

Psychology (A) – *: Bachelor of Arts (B.A.) - Major Concentration Psychology (36 credits)*

Software Engineering (AS) – *section 10.6.1: Bachelor of Arts and Science (B.A. & Sc.) - Major Concentration Software Engineering (37 credits)*

9.2 Interfaculty Programs

The Interfaculty programs available to B.A. & Sc. students are listed here and are described in detail either under *Programs, Courses and University Regulations > Bachelor of Arts & Science > Undergraduate* (AS) or under *Programs, Courses and University Regulations > McGill School of Environment > Undergraduate* (E) as indicated.

Cognitive Science (AS) – *section 10.5.3: Bachelor of Arts and Science (B.A. & Sc.) - Interfaculty Program Cognitive Science (54 credits)*

Environment (E) – see *Programs, Courses and University Regulations > McGill School of Environment > Undergraduate > Academic Programs > : Bachelor of Arts and Science (B.A. & Sc.) - Interfaculty Program Environment (54 credits)*

Sustainability, Science and Society (AS) – *section 10.9.1: Bachelor of Arts and Science (B.A. & Sc.) - Interfaculty Program in Sustainability, Science and Society (54 credits)*

9.3 Honours Programs

There are two Honours programs available to B.A. & Sc. students:

- The Honours Program in Environment is described in detail in *Programs, Courses and University Regulations > Faculties & Schools > McGill School of Environment > Undergraduate > Academic Programs > : Honours Program in Environment*.
- The Honours Program in Cognitive Science is described in detail in *section 10.5: Cognitive Science*.

Students interested in an Honours degree should also consider the Joint Honours programs; see *section 9.4: Joint Honours Programs*.

9.4 Joint Honours Programs

Joint Honours programs in the B.A. & Sc. are created by combining a Joint Honours program component from an Arts discipline with one from a Science discipline. Students must register for both Joint Honours program components. Joint Honours students should consult an adviser in each department to discuss their course selection and their interdisciplinary research project (if applicable).

9.4.1 Faculty of Arts

The Arts Joint Honours components available to B.A. & Sc. students are listed here and are described in detail under *Programs, Courses and University Regulations > Faculties & Schools > Faculty of Arts* .

Faculty of Arts Joint Honours Programs

Anthropology – *: Bachelor of Arts (B.A.) - Joint Honours Component Anthropology (36 credits)*

Art History – *: Bachelor of Arts (B.A.) - Joint Honours Component Art History (36 credits)*

Faculty of Arts Joint Honours Programs

Canadian Studies – *: Bachelor of Arts (B.A.) - Joint Honours Component Canadian Studies (36 credits)*

Classics – *: Bachelor of Arts (B.A.) - Joint Honours Component Classics (36 credits)*

East Asian Studies – *: Bachelor of Arts (B.A.) - Joint Honours Component East Asian Studies (36 credits)*

Economics – *: Bachelor of Arts (B.A.) - Joint Honours Component Economics (30 credits)*

English – Cultural Studies – *: Bachelor of Arts (B.A.) - Joint Honours Component English - Cultural Studies (36 credits)*

English – Drama and Theatre – *: Bachelor of Arts (B.A.) - Joint Honours Component English - Drama and Theatre (36 credits)*

English – Literature – *: Bachelor of Arts (B.A.) - Joint Honours Component English - Literature (36 credits)*

Geography – *: Bachelor of Arts (B.A.) - Joint Honours Component Geography (36 credits)*

German Studies – *: Bachelor of Arts (B.A.) - Joint Honours Component German Studies (36 credits)*

Hispanic Studies – *: Bachelor of Arts (B.A.) - Joint Honours Component Hispanic Studies (36 credits)*

History – *: Bachelor of Arts (B.A.) - Joint Honours Component History (36 credits)*

International Development Studies – *: Bachelor of Arts (B.A.) - Joint Honours Component International Development Studies (36 credits)*

Italian Studies – *: Bachelor of Arts (B.A.) - Joint Honours Component Italian Studies (36 credits)*

Jewish Studies – *: Bachelor of Arts (B.A.) - Joint Honours Component Jewish Studies (36 credits)*

Langue et littérature françaises – Études et pratiques littéraires – *: Bachelor of Arts (B.A.) - Double Spécialisation en langue et littérature françaises - Études et pratiques littéraires (36 crédits)*

Langue et littérature françaises – Traduction – *: Bachelor of Arts (B.A.) - Double Spécialisation en langue et littérature françaises - Traduction (36 crédits)*

Linguistics – *: Bachelor of Arts (B.A.) - Joint Honours Component Linguistics (36 credits)*

Middle East Studies – *: Bachelor of Arts (B.A.) - Joint Honours Component Middle East Studies (36 credits)*

Philosophy – *: Bachelor of Arts (B.A.) - Joint Honours Component Philosophy (36 credits)*

Philosophy and Western Religions – *: Bachelor of Arts (B.A.) - Joint Honours Component Philosophy and Western Religions (36 credits)*

Political Science – *: Bachelor of Arts (B.A.) - Joint Honours Component Political Science (36 credits)*

Religious Studies - Asian Religions – *: Bachelor of Arts (B.A.) - Joint Honours Component Religious Studies - Asian Religions (36 credits)*

Religious Studies - Western Religions – *: Bachelor of Arts (B.A.) - Joint Honours Component Religious Studies - Western Religions (36 credits)*

Russian – *: Bachelor of Arts (B.A.) - Joint Honours Component Russian (36 credits)*

Sociology – *: Bachelor of Arts (B.A.) - Joint Honours Component Sociology (36 credits)*

Women's Studies – *: Bachelor of Arts (B.A.) - Joint Honours Component Women's Studies (36 credits)*

9.4.2 Faculty of Science

There are currently only two Science Joint Honours components available to B.A. & Sc. students, which are listed here and are described in detail under *Programs, Courses and University Regulations > Faculties & Schools > Faculty of Arts* .

Faculty of Science Joint Honours Programs

Mathematics – *: Bachelor of Arts (B.A.) - Joint Honours Component Mathematics (36 credits)*

Psychology – *: Bachelor of Arts (B.A.) - Joint Honours Component Psychology (36 credits)*

9.5 Minor Concentrations or Minors

9.5.1 Faculty of Arts

The Arts minor concentrations available to B.A. & Sc. students are listed here and are described in detail under *Programs, Courses and University Regulations > Faculties & Schools > Faculty of Arts* . Since the B.A. & Sc. degree requires a certain number of credits in the Arts and in the Sciences, there are special requirements for B.A. & Sc. students. To be counted as an Arts minor or minor concentration, the program must include at least 15 credits of Arts courses. Similarly, to be counted as a Science minor or minor concentration, the program must include at least 15 credits of Science courses.

For example, a student completing the 18-credit African Studies Minor Concentration in Arts must complete at least 15 of those credits in Arts courses and at most 3 credits in Science courses. As another example, a student completing a 24-credit Science Minor in Interdisciplinary Life Sciences must complete at least 15 credits in Science courses and at most 9 credits in Arts courses.

Faculty of Arts Minor Concentrations or Minors

African Studies – *: Bachelor of Arts (B.A.) - Minor Concentration African Studies (18 credits)*

Anthropology – *: Bachelor of Arts (B.A.) - Minor Concentration Anthropology (18 credits)*

Art History– *: Bachelor of Arts (B.A.) - Minor Concentration Art History (18 credits)*

Canadian Ethnic and Racial Studies – *: Bachelor of Arts (B.A.) - Minor Concentration Canadian Ethnic and Racial Studies (18 credits)*

Canadian Studies – *: Bachelor of Arts (B.A.) - Minor Concentration Canadian Studies (18 credits)*

Catholic Studies – *: Bachelor of Arts (B.A.) - Minor Concentration Catholic Studies (18 credits)*

Classics – *: Bachelor of Arts (B.A.) - Minor Concentration Classics (18 credits)*

Communication Studies – *: Bachelor of Arts (B.A.) - Minor Concentration Communication Studies (18 credits)*

Comparative Politics – *Political Science (POLI) > : Bachelor of Arts (B.A.) - Minor Concentration Comparative Politics (18 credits)*

East Asian Language and Literature – *: Bachelor of Arts (B.A.) - Minor Concentration East Asian Language and Literature (18 credits)*

East Asian Cultural Studies – *: Bachelor of Arts (B.A.) - Minor Concentration East Asian Cultural Studies (18 credits)*

East Asian Studies, Supplementary – *: Bachelor of Arts (B.A.) - Minor Concentration Supplementary East Asian Language (18 credits)*

Economics – *: Bachelor of Arts (B.A.) - Minor Concentration Economics (18 credits)*

English – Cultural Studies – *: Bachelor of Arts (B.A.) - Minor Concentration English - Cultural Studies (18 credits)*

English – Drama and Theatre – *: Bachelor of Arts (B.A.) - Minor Concentration English - Drama and Theatre (18 credits)*

English – Literature – *: Bachelor of Arts (B.A.) - Minor Concentration English - Literature (18 credits)*

Geography – *: Bachelor of Arts (B.A.) - Minor Concentration Geography (18 credits)*

Geography (Urban Systems) – *: Bachelor of Arts (B.A.) - Minor Concentration Geography (Urban Systems) (18 credits)*

German Language – *: Bachelor of Arts (B.A.) - Minor Concentration German Language (18 credits)*

German Literature – *: Bachelor of Arts (B.A.) - Minor Concentration German Literature (18 credits)*

German Literature and Culture in Translation – *: Bachelor of Arts (B.A.) - Minor Concentration German Literature and Culture in Translation (18 credits)*

Hispanic Languages – *: Bachelor of Arts (B.A.) - Minor Concentration Hispanic Languages (18 credits)*

Hispanic Literature and Culture – *: Bachelor of Arts (B.A.) - Minor Concentration Hispanic Literature and Culture (18 credits)*

History – *: Bachelor of Arts (B.A.) - Minor Concentration History (18 credits)*

History and Philosophy of Science – *: Bachelor of Arts (B.A.) - Minor Concentration History and Philosophy of Science (18 credits)*

International Development Studies – *: Bachelor of Arts (B.A.) - Minor Concentration International Development Studies (18 credits)*

International Relations – *Political Science (POLI) > : Bachelor of Arts (B.A.) - Minor Concentration International Relations (18 credits)*

Islamic Studies –*: Bachelor of Arts (B.A.) - Minor Concentration Islamic Studies (18 credits)*

Italian Studies – *: Bachelor of Arts (B.A.) - Minor Concentration Italian Studies (18 credits)*

Jewish Law – *: Bachelor of Arts (B.A.) - Minor Concentration Jewish Law (18 credits)*

Jewish Studies – *: Bachelor of Arts (B.A.) - Minor Concentration Jewish Studies (18 credits)*

Langue et littérature françaises – Critique littéraire – *: Bachelor of Arts (B.A.) - Concentration mineure langue et littérature françaises - Critique littéraire (18 crédits)*

Langue et littérature françaises – Études et pratiques littéraires – *: Bachelor of Arts (B.A.) - Concentration mineure langue et littérature françaises - Études et pratiques littéraires (18 crédits)*

Langue et littérature françaises – Langue française – *: Bachelor of Arts (B.A.) - Concentration mineure langue et littérature françaises - Langue française (18 crédits)*

Langue et littérature françaises – Langue française et traduction – *: Bachelor of Arts (B.A.) - Concentration mineure langue et littérature françaises - Langue française et traduction (18 crédits)*

Langue et littérature françaises – Traduction – *: Bachelor of Arts (B.A.) - Concentration mineure langue et littérature françaises - Traduction (18 crédits)*

Faculty of Arts Minor Concentrations or Minors

Linguistics – *: Bachelor of Arts (B.A.) - Minor Concentration Linguistics (18 credits)*

Middle East Languages – *: Bachelor of Arts (B.A.) - Minor Concentration Middle East Languages (18 credits)*

Middle East Studies – *: Bachelor of Arts (B.A.) - Minor Concentration Middle East Studies (18 credits)*

North American Studies – *: Bachelor of Arts (B.A.) - Minor Concentration North American Studies (18 credits)*

Philosophy – *: Bachelor of Arts (B.A.) - Minor Concentration Philosophy (18 credits)*

Philosophy and Western Religions – *: Bachelor of Arts (B.A.) - Minor Concentration Philosophy and Western Religions (18 credits)*

Political Economy – *Political Science (POLI) > : Bachelor of Arts (B.A.) - Minor Concentration Political Economy (18 credits)*

Political Science – *: Bachelor of Arts (B.A.) - Minor Concentration Political Science (18 credits)*

Political Science: Canada/Quebec – *: Bachelor of Arts (B.A.) - Minor Concentration Political Science: Canada/Québec (18 credits)*

Political Theory – *: Bachelor of Arts (B.A.) - Minor Concentration Political Theory (18 credits)*

Politics, Law and Society – *Political Science (POLI) > : Bachelor of Arts (B.A.) - Minor Concentration Politics, Law and Society (18 credits)*

Quebec Studies – *: Bachelor of Arts (B.A.) - Minor Concentration Quebec Studies / La concentration Mineur en Études sur le Québec (18 credits)*

Russian – *: Bachelor of Arts (B.A.) - Minor Concentration Russian (18 credits)*

Russian Culture – *: Bachelor of Arts (B.A.) - Minor Concentration Russian Culture (18 credits)*

Scriptural Languages – *Religious Studies (RELG) > : Bachelor of Arts (B.A.) - Minor Concentration Scriptural Languages (18 credits)*

Sexual Diversity Studies – *: Bachelor of Arts (B.A.) - Minor Concentration Sexual Diversity Studies (18 credits)*

Social Studies of Medicine – *: Bachelor of Arts (B.A.) - Minor Concentration Social Studies of Medicine (18 credits)*

Sociology – *: Bachelor of Arts (B.A.) - Minor Concentration Sociology (18 credits)*

South Asia – *Political Science (POLI) > : Bachelor of Arts (B.A.) - Minor Concentration South Asia (18 credits)*

Women's Studies – *: Bachelor of Arts (B.A.) - Minor Concentration Women's Studies (18 credits)*

World Religions – *Religious Studies (RELG) > : Bachelor of Arts (B.A.) - Minor Concentration World Religions (18 credits)*

9.5.2 Faculty of Science

The Science minors (M) or minor concentrations (MC) available to B.A. & Sc. students are listed here and are described in detail either under *Programs, Courses and University Regulations > Faculties & Schools > Faculty of Science* (S), *Faculty of Arts* (A), *Bachelor of Arts & Science* (AS), or *McGill School of Environment* (E) as indicated.

Faculty of Science Minor Concentrations or Minors

Atmospheric Science (M-S) – *: Bachelor of Science (B.Sc.) - Minor Atmospheric Science (18 credits)*

Biology – Cell/Molecular (MC-AS) – *section 10.2.1: Bachelor of Arts and Science (B.A. & Sc.) - Minor Concentration Biology - Cell/Molecular (19 credits)*

Biology – Organismal (MC-AS) – *section 10.2.2: Bachelor of Arts and Science (B.A. & Sc.) - Minor Concentration Biology - Organismal (19 credits)*

Chemistry (M-S) – *: Bachelor of Science (B.Sc.) - Minor Chemistry (18 credits)*

Computer Science (MC-A) – *: Bachelor of Arts (B.A.) - Minor Concentration Computer Science (18 credits)*

Environment (M-E) – *: Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) or Bachelor of Science (B.Sc.) - Minor Environment (18 credits)*

Geographic Information Systems and Remote Sensing (M-S) – *: Bachelor of Science (B.Sc.) - Minor Geographic Information Systems and Remote Sensing (18 credits)*

Geography (M-S) – *: Bachelor of Science (B.Sc.) - Minor Geography (18 credits)*

Geology (M-S) – *: Bachelor of Science (B.Sc.) - Minor Geology (18 credits)* (*previously named Earth and Planetary Sciences*)

Interdisciplinary Life Sciences (M-S) – *: Bachelor of Science (B.Sc.) - Minor Interdisciplinary Life Sciences (24 credits)*

Mathematics (MC-A) – *: Bachelor of Arts (B.A.) - Minor Concentration Mathematics (18 credits)*

Physics (M-S) – *: Bachelor of Science (B.Sc.) - Minor Physics (18 credits)*

Psychology (MC-A) – *: Bachelor of Arts (B.A.) - Minor Concentration Psychology (18 credits)*

Faculty of Science Minor Concentrations or Minors

Statistics (MC-A; see Mathematics & Statistics) – *: Bachelor of Arts (B.A.) - Minor Concentration Statistics (18 credits)*

9.6 Integrative Courses

9.6.1 Complementary Integrative Courses

Students in the B.A. & Sc. are required to complete at least one integrative course (at least 3 credits), possibly within one of their programs, chosen from the following list:

ANTH 201	(3)	Prehistoric Archaeology
ANTH 203	(3)	Human Evolution
ANTH 208	(3)	Evolutionary Anthropology
ANTH 227	(3)	Medical Anthropology
ANTH 302	(3)	New Horizons in Medical Anthropology
ANTH 311	(3)	Primate Behaviour and Ecology
ANTH 312	(3)	Zooarchaeology
ANTH 411	(3)	Primate Studies & Conservation
ANTH 418	(3)	Environment and Development
ANTH 423	(3)	Mind, Brain and Psychopathology
ANTH 443	(3)	Medical Anthropological Theory
ANTH 511	(3)	Computational Approaches to Prehistory
BASC 201	(3)	Arts & Science Integrative Topics
BASC 396	(3)	Undergraduate Research Project
BASC 449 D1,D2	(6)	Integrative Research Project
BIOL 210	(3)	Perspectives of Science
BIOL 307	(3)	Behavioural Ecology/Sociobiology
COMP 280	(3)	History and Philosophy of Computing
COMS 200	(3)	History of Communication
COMS 210	(3)	Introduction to Communication Studies
ECON 225	(3)	Economics of the Environment
ECON 310	(3)	Introduction to Behavioural Economics
ECON 326	(3)	Ecological Economics
ECON 347	(3)	Economics of Climate Change
ECON 405	(3)	Natural Resource Economics
ECON 440	(3)	Health Economics
ECON 546	(3)	Game Theory
ENVR 200	(3)	The Global Environment
ENVR 201	(3)	Society, Environment, and Sustainability
ENVR 202	(3)	The Evolving Earth
ENVR 203	(3)	Knowledge, Ethics and Environment
GEOG 200	(3)	Geographical Perspectives: World Environmental Problems
GEOG 203	(3)	Environmental Systems
GEOG 221	(3)	Environment and Health

GEOG 302	(3)	Environmental Management 1
GEOG 303	(3)	Health Geography
GEOG 350	(3)	Ecological Biogeography
HIST 238	(3)	Histories of Science
HIST 249	(3)	Health and the Healer in Western History
HIST 292	(3)	History and the Environment
HIST 319	(3)	The Scientific Revolution
HIST 330	(3)	Science in the Medieval West
HIST 348	(3)	China: Science-Medicine-Technology
HIST 350	(3)	Science and the Enlightenment
HIST 356	(3)	Medicine in the Medieval West
HIST 424	(3)	Gender, Sexuality & Medicine
LING 390	(3)	Neuroscience of Language
LING 555	(3)	Language Acquisition 2
MATH 328	(3)	Computability and Mathematical Linguistics
MATH 338	(3)	History and Philosophy of Mathematics
PHIL 220	(3)	Introduction to History and Philosophy of Science 1
PHIL 221	(3)	Introduction to History and Philosophy of Science 2
PHIL 341	(3)	Philosophy of Science 1
PHIL 350	(3)	History and Philosophy of Ancient Science
PHIL 361	(3)	18th Century Philosophy
PHIL 411	(3)	Topics in Philosophy of Logic and Mathematics
PHIL 441	(3)	Philosophy of Science 2
SOCI 225	(3)	Medicine and Health in Modern Society
SOCI 234	(3)	Population and Society
SOCI 235	(3)	Technology and Society
SOCI 338	(3)	Introduction to Biomedical Knowledge
SOCI 390	(3)	Gender and Health
SOCI 508	(3)	Medical Sociology and Social Psychiatry
SOCI 525	(3)	Health Care Systems in Comparative Perspective

As a substitute, students can fulfil the requirement for a complementary integrative course by conducting library or empirical research that integrates the components of their program as a 3- or 6-credit independent study course, thesis course, or research course, with approval of the Director of Advising Services, Science.

10 Academic Programs

The B.A. & Sc. is an interdisciplinary degree intended for students who want to pursue simultaneously a program offered by Arts and one offered by Science. The overall objective is to provide a broad, liberal education spanning substantive areas in the two faculties so that students can learn diverse content and varied methods of inquiry.

10.1 Programs in Arts or in Science

All B.A. & Sc. Arts programs are described in detail under *Programs, Courses and University Regulations* > *Faculties & Schools* > *Faculty of Arts* . B.A. & Sc. Science programs that are open to B.A. students (i.e., programs in Computer Science, Mathematics and Statistics, and Psychology as well as some in

Geography) are described under *Programs, Courses and University Regulations > Faculties & Schools >* *Faculty of Arts* . Science Minors that are open to B.A. & Sc. students are described under *Programs, Courses and University Regulations > Faculties & Schools >* *Faculty of Science* . B.A. & Sc. Science programs that are open only to B.A. & Sc. students are described under *Bachelor of Arts and Science* .

For information about where each B.A. & Sc. program is listed, see *section 9: Overview of Programs Offered*.

10.2 Biology (BIOL)

The Department of Biology, the discipline, and specific courses are described under *Programs, Courses and University Regulations > Faculties & Schools > Faculty of Science > Undergraduate > Academic Programs (Faculty of Science) > : Biology (BIOL)*.

The minimum freshman science requirements in the B.A. & Sc. may not satisfy the introductory science requirements of all medical/dental schools. Please see your departmental adviser for more information.

10.2.1 Bachelor of Arts and Science (B.A. & Sc.) - Minor Concentration Biology - Cell/Molecular (19 credits)

The Minor Concentration Biology - Cell/Molecular, is restricted to students in the B.A. & Sc. It is a sequence of courses designed to yield a broad introduction to cell/molecular biology.

Advising Note: Students interested in a Biology minor concentration must choose either the Cell/Molecular option or the Organismal option, but may not take both. Students interested in a more in-depth program in Biology should consider the Major concentration.

Students may complete this program with a minimum of 18 credits or a maximum of 19 credits depending if they are exempt from taking CHEM 212 and their choice of complementary courses.

Required Courses* (13 credits)

* Required courses taken at CEGEP or elsewhere that are not credited toward the B.A. & Sc. must be replaced by approved complementary courses. Regardless of the substitution, students must take at least 18 credits in this program.

** Students who have already taken CHEM 212 or its equivalent will choose another appropriate complementary course, to be approved by the Adviser.

BIOL 200	(3)	Molecular Biology
BIOL 201	(3)	Cell Biology and Metabolism
BIOL 202	(3)	Basic Genetics
CHEM 212**	(4)	Introductory Organic Chemistry 1

Complementary Courses (6 credits)

Any 6 credits of biology courses at the 300 level or higher approved by the Adviser.

10.2.2 Bachelor of Arts and Science (B.A. & Sc.) - Minor Concentration Biology - Organismal (19 credits)

The Minor Concentration Biology - Organismal, is restricted to students in the B.A. & Sc. It is a sequence of courses designed to yield a broad introduction to organismal biology.

Advising Note: Students interested in a Biology minor concentration must choose either the Cell/Molecular option or the Organismal option, but may not take both. Students interested in a more in-depth program in Biology should consider the Major concentration.

Students may complete this program with a minimum of 18 credits or a maximum of 19 credits depending if they are exempt from taking CHEM 212 and their choice of complementary course.

Required Courses* (16 credits)

* Required courses taken at CEGEP or elsewhere that are not credited toward the B.A. & Sc. must be replaced by approved complementary courses. Regardless of the substitution, students must take at least 18 credits in this program.

** Students who have already taken CHEM 212 or its equivalent will choose another appropriate complementary course, to be approved by the adviser.

BIOL 200	(3)	Molecular Biology
BIOL 201	(3)	Cell Biology and Metabolism
BIOL 205	(3)	Biology of Organisms
BIOL 215	(3)	Introduction to Ecology and Evolution
CHEM 212**	(4)	Introductory Organic Chemistry 1

Complementary Course (3 credits)

Any 3-credit biology course at the 300 level or higher approved by the adviser.

10.2.3 Bachelor of Arts and Science (B.A. & Sc.) - Major Concentration Biology - Cell/Molecular (36 credits)

The Major Concentration Biology - Cell/Molecular is a planned sequence of courses designed to permit a degree of specialization in cell/molecular biology.

Advising Note: Freshman students should be aware that PHYS 101 and/or PHYS 102 are required for some of the courses in the major and minor concentrations in Biology.

Required Courses* (29 credits)

* Required courses taken at CEGEP or elsewhere that are not credited toward the B.A. & Sc. or B.Sc./B.Ed. must be replaced by 3-credit courses from the Complementary Courses list. Regardless of the substitution, students must take at least 36 credits in this program.

** Students who have already taken CHEM 212 or its equivalent will choose another appropriate complementary course, to be approved by the Adviser.

BIOL 200	(3)	Molecular Biology
BIOL 201	(3)	Cell Biology and Metabolism
BIOL 202	(3)	Basic Genetics
BIOL 205	(3)	Biology of Organisms
BIOL 215	(3)	Introduction to Ecology and Evolution
BIOL 300	(3)	Molecular Biology of the Gene
BIOL 301	(4)	Cell and Molecular Laboratory
BIOL 303	(3)	Developmental Biology
CHEM 212**	(4)	Introductory Organic Chemistry 1

Complementary Courses (7 credits)

at least 7 credits selected from:

BIOL 306	(3)	Neural Basis of Behaviour
BIOL 313	(3)	Eukaryotic Cell Biology
BIOL 314	(3)	Molecular Biology of Oncogenes
BIOL 316	(3)	Eukaryotic Cell Biology 2
BIOL 370	(3)	Human Genetics Applied
BIOL 373	(3)	Biometry
BIOL 413	(1)	Directed Reading
BIOL 568	(3)	Topics on the Human Genome
BIOL 575	(3)	Human Biochemical Genetics

or other appropriate course at the 300 level or higher with permission of the Adviser.

10.2.4 Bachelor of Arts and Science (B.A. & Sc.) - Major Concentration Biology - Organismal (37 credits)

The Major Concentration Biology - Organismal is a planned sequence of courses designed to permit a degree of specialization in organismal biology.

Students may complete this program with a minimum of 36 credits or a maximum of 37 credits depending if they have already taken CHEM 212 or its equivalent, and on their choice of complementary courses.

Advising Note: Freshman students should be aware that PHYS 101 and/or PHYS 102 are required for some of the courses in the major and minor concentrations in Biology.

Required Courses* (28 credits)

* Required courses taken at CEGEP or elsewhere that are not credited toward the B.A. & Sc. or B.Sc./B.Ed. must be replaced by 3-credit courses from the Complementary Courses list. Regardless of the substitution, students must take at least 36 credits in this program.

** Students who have already taken CHEM 212 or its equivalent will choose another appropriate complementary course, to be approved by the Adviser.

BIOL 200	(3)	Molecular Biology
BIOL 201	(3)	Cell Biology and Metabolism
BIOL 202	(3)	Basic Genetics
BIOL 205	(3)	Biology of Organisms
BIOL 206	(3)	Methods in Biology of Organisms
BIOL 215	(3)	Introduction to Ecology and Evolution
BIOL 304	(3)	Evolution
BIOL 308	(3)	Ecological Dynamics
CHEM 212**	(4)	Introductory Organic Chemistry 1

Complementary Courses (9 credits)

9 credits selected from:

BIOL 303	(3)	Developmental Biology
BIOL 305	(3)	Animal Diversity
BIOL 306	(3)	Neural Basis of Behaviour
BIOL 307	(3)	Behavioural Ecology/Sociobiology
BIOL 310	(3)	Biodiversity and Ecosystems
BIOL 331	(3)	Ecology/Behaviour Field Course
BIOL 342	(3)	Marine Biology
BIOL 350	(3)	Insect Biology and Control
BIOL 352	(3)	Vertebrate Evolution
BIOL 373	(3)	Biometry
BIOL 418	(3)	Freshwater Invertebrate Ecology
BIOL 427	(3)	Herpetology
BIOL 435	(3)	Natural Selection
BIOL 441	(3)	Biological Oceanography
BIOL 463	(3)	Mammalian Evolution
BIOL 465	(3)	Conservation Biology

or other appropriate course at the 300 level or higher with permission of the Adviser.

10.3 Biomedical Sciences

10.3.1 Location

Program Adviser:
Ms. Sonia Viselli
Student Affairs Officer, Department of Physiology
McIntyre Medical Sciences Building, Room 1022
3655 Promenade Sir-William-Osler
Montreal, Quebec H3G 1Y6

Telephone: 514-398-3689
Email: *sonia.viselli@mcgill.ca*

10.3.2 About Biomedical Sciences

The Major Concentration in Biomedical Sciences has been retired. Students completing the program should refer to the Calendar (*www.mcgill.ca/students/courses/calendars*) at their time of entrance to the program for the program requirements and consult with their academic adviser.

10.4 Chemistry (CHEM)

The Department of Chemistry, the discipline, and specific courses are described under *Programs, Courses and University Regulations > Faculties & Schools > Faculty of Science > Undergraduate > Academic Programs (Faculty of Science) > : Chemistry (CHEM).*

The Major Concentration Chemistry is not certified by the *Ordre des Chimistes du Québec*. Students interested in pursuing a career in Chemistry in Quebec are advised to take an appropriate B.Sc. program in Chemistry. The minimum freshman science requirements in the B.A. & Sc. may not satisfy the introductory science requirements of all medical/dental schools (see *section 5.4: Bachelor of Arts and Science (B.A. & Sc.) - Freshman Program (30 credits)*).

10.4.1 Bachelor of Arts and Science (B.A. & Sc.) - Major Concentration Chemistry (36 credits)

The Major Concentration Chemistry is not certified by the Ordre des Chimistes du Québec. Students interested in pursuing a career in Chemistry in Quebec are advised to take an appropriate B.Sc. program in Chemistry.

The Major Concentration Chemistry, which is restricted to students in the B.A. & Sc. or B.Sc./B.Ed., is a planned sequence of courses designed to permit a degree of specialization in this discipline.

Required Courses* (18 credits)

* Required courses taken at CEGEP or elsewhere that are not credited toward the B.A. & Sc. or B.Sc./B.Ed. must be replaced by courses from the Complementary Course List equal to or exceeding their credit value. Regardless of the substitution, students must take at least 36 credits in this program.

CHEM 203	(3)	Survey of Physical Chemistry
CHEM 212	(4)	Introductory Organic Chemistry 1
CHEM 222	(4)	Introductory Organic Chemistry 2
CHEM 253	(1)	Introductory Physical Chemistry 1 Laboratory
CHEM 281	(3)	Inorganic Chemistry 1
CHEM 287	(2)	Introductory Analytical Chemistry
CHEM 297	(1)	Introductory Analytical Chemistry Laboratory

Complementary Courses (18 credits)

18 credits selected from:

CHEM 219	(3)	Introduction to Atmospheric Chemistry
CHEM 263	(1)	Introductory Physical Chemistry 2 Laboratory
CHEM 302	(3)	Introductory Organic Chemistry 3
CHEM 307	(3)	Analytical Chemistry of Pollutants
CHEM 334	(3)	Advanced Materials
CHEM 367	(3)	Instrumental Analysis 1
CHEM 381	(3)	Inorganic Chemistry 2
CHEM 382	(3)	Organic Chemistry: Natural Products
CHEM 531	(3)	Chemistry of Inorganic Materials
CHEM 571	(3)	Polymer Synthesis
CHEM 582	(3)	Supramolecular Chemistry
CHEM 591	(3)	Bioinorganic Chemistry

10.5 Cognitive Science

10.5.1 Location

Ian Gold
Director, Program in Cognitive Science
3465 Peel Street, Room 401
Montreal, Quebec H3A 1W7

Interdisciplinary Programs Adviser
Ryan Bouma, Interim Adviser
Email: *ryan.bouma@mcgill.ca*
Telephone: 514-398-7330

Website: *www.mcgill.ca/cogsci*

10.5.2 About Cognitive Science

Cognitive Science is the multidisciplinary study of cognition in humans and machines. The goal is to understand the principles of intelligence and thought with the hope that this will lead to a better understanding of the mind and of learning, and to the development of intelligent devices that constructively extend human abilities.

An Interfaculty Program in Cognitive Science (54 credits) is offered by the following departments:

Computer Science (COMP) (Science)
Linguistics (LING) (Arts)
Philosophy (PHIL) (Arts)
Psychology (PSYC) (Science)

Cognitive Science Committee Members:

Brendan Gillon (*Linguistics*)

Stephen McAdams (*Music*)

Doina Precup (*Computer Science*)

David Ragsdale (*Neuroscience*)

Debra Titone (*Psychology*)

Please note: New students are required to attend an information session held at the end of August. Please consult the cognitive science website in early August for the date and location.

10.5.3 Bachelor of Arts and Science (B.A. & Sc.) - Interfaculty Program Cognitive Science (54 credits)

The Interfaculty Program Cognitive Science, which is restricted to students in the B.A. & Sc., is a planned sequence of courses designed to permit students to focus on at least two relevant areas of study.

Note: B.A. & Sc. students who take interfaculty programs must take at least 30 credits in Arts and 30 credits in Science across their interfaculty program and their minor or minor concentration.

Required Course (3 credits)

PSYC 532	(3)	Cognitive Science

Complementary Courses (51 credits)

Credits are selected as follows:

3 credits from the following:

COMP 230	(3)	Logic and Computability

MATH 318	(3)	Mathematical Logic
PHIL 210	(3)	Introduction to Deductive Logic 1

18 credits from List A in one of the following five units: Computer Science, Linguistics, Neuroscience, Philosophy, or Psychology.

12 credits from List A in one of the four remaining units.

18 credits chosen from Lists A and/or B in Computer Science, Linguistics, Neuroscience, Philosophy, Psychology, and/or Research Courses of which at least 12 credits must be at the 400 level or higher.

Note 1: Students are responsible for ensuring that they meet all pre- and corequisites for all their courses.

Note 2: With the permission of the Director of the Cognitive Science program, students may be able to substitute up to 6 credits in cognate departments, such as Anatomy and Cell Biology, Biology, Neurology, or Physiology. For further information, consult the Cognitive Science website: http://www.mcgill.ca/cogsci.

Computer Science

List A:

COMP 202	(3)	Foundations of Programming
COMP 206	(3)	Introduction to Software Systems
COMP 250	(3)	Introduction to Computer Science
COMP 251	(3)	Algorithms and Data Structures
COMP 302	(3)	Programming Languages and Paradigms
COMP 424	(3)	Artificial Intelligence
COMP 527	(3)	Logic and Computation
MATH 240	(3)	Discrete Structures 1

List B:

COMP 280	(3)	History and Philosophy of Computing
COMP 330	(3)	Theory of Computation
COMP 360	(3)	Algorithm Design
COMP 400	(3)	Honours Project in Computer Science
COMP 409	(3)	Concurrent Programming
COMP 417	(3)	Introduction Robotics and Intelligent Systems
COMP 421	(3)	Database Systems
COMP 526	(3)	Probabilistic Reasoning and AI
COMP 531	(3)	Advanced Theory of Computation
COMP 558	(3)	Fundamentals of Computer Vision
MATH 222	(3)	Calculus 3
MATH 223	(3)	Linear Algebra

Linguistics

List A:

LING 201	(3)	Introduction to Linguistics
LING 330	(3)	Phonetics
LING 331	(3)	Phonology 1
LING 350	(3)	Linguistic Aspects of Bilingualism

LING 355	(3)	Language Acquisition 1
LING 360	(3)	Introduction to Semantics
LING 371	(3)	Syntax 1
LING 390	(3)	Neuroscience of Language
LING 419	(3)	Linguistic Theory and its Foundations
LING 451	(3)	Acquisition of Phonology
LING 455	(3)	Second Language Syntax

List B:

LING 417	(3)	Topics at the Interfaces 1
LING 418	(3)	Topics at the Interfaces 2
LING 440	(3)	Morphology
LING 461	(3)	Formal Methods in Linguistics
LING 531	(3)	Phonology 2
LING 555	(3)	Language Acquisition 2
LING 565	(3)	Pragmatics
LING 571	(3)	Syntax 2
LING 590	(3)	Language Acquisition and Breakdown

Philosophy

List A:

NSCI 300	(3)	Neuroethics
PHIL 304	(3)	Chomsky
PHIL 306	(3)	Philosophy of Mind
PHIL 310	(3)	Intermediate Logic
PHIL 341	(3)	Philosophy of Science 1
PHIL 360	(3)	17th Century Philosophy
PHIL 370	(3)	Problems in Analytic Philosophy
PHIL 415	(3)	Philosophy of Language
PHIL 419	(3)	Epistemology
PHIL 441	(3)	Philosophy of Science 2
PHIL 506	(3)	Seminar: Philosophy of Mind

List B:

PHIL 410	(3)	Advanced Topics in Logic 1
PHIL 411	(3)	Topics in Philosophy of Logic and Mathematics
PHIL 421	(3)	Metaphysics
PHIL 470	(3)	Topics in Contemporary Analytic Philosophy
PHIL 474	(3)	Phenomenology
PHIL 511	(3)	Seminar: Philosophy of Logic and Mathematics

Psychology

List A/B:

ANTH 440	(3)	Cognitive Anthropology
MUMT 250	(3)	Music Perception and Cognition
NSCI 201	(3)	Introduction to Neuroscience 2
PSYC 204	(3)	Introduction to Psychological Statistics
PSYC 212	(3)	Perception
PSYC 213	(3)	Cognition
PSYC 301	(3)	Animal Learning & Theory
PSYC 304	(3)	Child Development
PSYC 305	(3)	Statistics for Experimental Design
PSYC 311	(3)	Human Cognition and the Brain
PSYC 315	(3)	Computational Psychology
PSYC 316	(3)	Psychology of Deafness
PSYC 318	(3)	Behavioural Neuroscience 2
PSYC 340	(3)	Psychology of Language
PSYC 341	(3)	The Psychology of Bilingualism
PSYC 352	(3)	Cognitive Psychology Laboratory
PSYC 353	(3)	Laboratory in Human Perception
PSYC 410	(3)	Special Topics in Neuropsychology
PSYC 413	(3)	Cognitive Development
PSYC 470	(3)	Memory and Brain
PSYC 522	(3)	Neurochemistry and Behaviour
PSYC 529	(3)	Music Cognition
PSYC 537	(3)	Advanced Seminar in Psychology of Language
PSYC 545	(3)	Topics in Language Acquisition
PSYC 561	(3)	Methods: Developmental Psycholinguistics

Neuroscience

List A/B:

* Students select either PHGY 311 or BIOL 306, but not both.

** Students select either BIOL 514 or PSYC 514, but not both.

*** Students select either NSCI 200 or PHGY 209, but not both.

ANAT 321	(3)	Circuitry of the Human Brain
BIOL 200	(3)	Molecular Biology
BIOL 201	(3)	Cell Biology and Metabolism
BIOL 306*	(3)	Neural Basis of Behaviour
BIOL 514**	(3)	Neurobiology Learning and Memory
BIOL 530	(3)	Advances in Neuroethology
BIOL 588	(3)	Advances in Molecular/Cellular Neurobiology
NEUR 310	(3)	Cellular Neurobiology
NSCI 200***	(3)	Introduction to Neuroscience 1
NSCI 201	(3)	Introduction to Neuroscience 2

NSCI 300	(3)	Neuroethics
PHGY 209***	(3)	Mammalian Physiology 1
PHGY 311*	(3)	Channels, Synapses & Hormones
PHGY 314	(3)	Integrative Neuroscience
PHGY 556	(3)	Topics in Systems Neuroscience
PSYC 211	(3)	Introductory Behavioural Neuroscience
PSYC 311	(3)	Human Cognition and the Brain
PSYC 317	(3)	Genes and Behaviour
PSYC 318	(3)	Behavioural Neuroscience 2
PSYC 342	(3)	Hormones and Behaviour
PSYC 410	(3)	Special Topics in Neuropsychology
PSYC 427	(3)	Sensorimotor Behaviour
PSYC 502	(3)	Psychoneuroendocrinology
PSYC 514**	(3)	Neurobiology of Learning and Memory
PSYC 522	(3)	Neurochemistry and Behaviour
PSYT 301	(3)	Issues in Drug Dependence
PSYT 500	(3)	Advances: Neurobiology of Mental Disorders

Research Courses

COGS 401	(6)	Research Cognitive Science 1
COGS 402	(6)	Research Cognitive Science 2

10.5.4 Bachelor of Arts and Science (B.A. & Sc.) - Honours Cognitive Science (60 credits)

The Honours Cognitive Science, which is restricted to students in the B.A. & Sc., is an extension of the Interfaculty program and offers students an opportunity to undertake a research project in close association with professors in their main Arts and Science focus areas. Prior to selecting the Honours program, students should meet with the Interdisciplinary Program Adviser and review the B.A. & Sc. academic requirements for Honours and First Class Honours, which can also be found under "University Regulations and Resources," "Graduation," and "Graduation Honours."

To receive an Honours degree, students are required to achieve a minimum overall program GPA of 3.3 at graduation, and attain a grade of B+ (3.3) or better in COGS 444. Students must complete both the 60-credit Honours program, plus an approved minor concentration or a minor in the Faculties of Arts or of Science.

Note: B.A. & Sc. students who take interfaculty programs, including the Honours in Cognitive Science, must take at least 30 credits in Arts and 30 in Science across their interfaculty program and their minor or minor concentration.

Required Courses (9 credits)

COGS 444	(6)	Honours Research
PSYC 532	(3)	Cognitive Science

Complementary Courses (51 credits)

Credits are selected as follows:

3 credits, one of:

COMP 230	(3)	Logic and Computability
MATH 318	(3)	Mathematical Logic
PHIL 210	(3)	Introduction to Deductive Logic 1

18 credits from List A in one of Computer Science, Linguistics, Neuroscience, Philosophy, or Psychology.

12 credits from List A in one of the four remaining units.

18 credits chosen from Lists A and/or B in Computer Science, Linguistics, Neuroscience, Philosophy, Psychology, and/or Research Courses of which at least 12 credits must be at the 400 level or higher.

Note 1: Students are responsible for ensuring that they meet all pre- and corequisites for all their courses.

Note 2: With the permission of the Director of the Cognitive Science program, students may be able to substitute courses in cognate departments, such as Anatomy and Cell Biology, Biology, Neurology, or Physiology. For further information, consult the Cognitive Science website: http://www.mcgill.ca/cogsci.

Computer Science

List A:

COMP 206	(3)	Introduction to Software Systems
COMP 250	(3)	Introduction to Computer Science
COMP 251	(3)	Algorithms and Data Structures
COMP 302	(3)	Programming Languages and Paradigms
COMP 424	(3)	Artificial Intelligence
COMP 527	(3)	Logic and Computation
MATH 240	(3)	Discrete Structures 1

List B:

COMP 280	(3)	History and Philosophy of Computing
COMP 330	(3)	Theory of Computation
COMP 360	(3)	Algorithm Design
COMP 400	(3)	Honours Project in Computer Science
COMP 409	(3)	Concurrent Programming
COMP 417	(3)	Introduction Robotics and Intelligent Systems
COMP 421	(3)	Database Systems
COMP 526	(3)	Probabilistic Reasoning and AI
COMP 531	(3)	Advanced Theory of Computation
COMP 558	(3)	Fundamentals of Computer Vision
MATH 222	(3)	Calculus 3
MATH 223	(3)	Linear Algebra

Linguistics

List A:

LING 201	(3)	Introduction to Linguistics
LING 330	(3)	Phonetics
LING 331	(3)	Phonology 1
LING 350	(3)	Linguistic Aspects of Bilingualism
LING 355	(3)	Language Acquisition 1
LING 360	(3)	Introduction to Semantics
LING 371	(3)	Syntax 1
LING 390	(3)	Neuroscience of Language

LING 419	(3)	Linguistic Theory and its Foundations
LING 451	(3)	Acquisition of Phonology
LING 455	(3)	Second Language Syntax

List B:

LING 417	(3)	Topics at the Interfaces 1
LING 418	(3)	Topics at the Interfaces 2
LING 440	(3)	Morphology
LING 461	(3)	Formal Methods in Linguistics
LING 531	(3)	Phonology 2
LING 555	(3)	Language Acquisition 2
LING 565	(3)	Pragmatics
LING 571	(3)	Syntax 2
LING 590	(3)	Language Acquisition and Breakdown

Philosophy

List A:

NSCI 300	(3)	Neuroethics
PHIL 304	(3)	Chomsky
PHIL 306	(3)	Philosophy of Mind
PHIL 310	(3)	Intermediate Logic
PHIL 341	(3)	Philosophy of Science 1
PHIL 360	(3)	17th Century Philosophy
PHIL 370	(3)	Problems in Analytic Philosophy
PHIL 415	(3)	Philosophy of Language
PHIL 419	(3)	Epistemology
PHIL 441	(3)	Philosophy of Science 2
PHIL 506	(3)	Seminar: Philosophy of Mind

List B:

PHIL 410	(3)	Advanced Topics in Logic 1
PHIL 411	(3)	Topics in Philosophy of Logic and Mathematics
PHIL 421	(3)	Metaphysics
PHIL 470	(3)	Topics in Contemporary Analytic Philosophy
PHIL 474	(3)	Phenomenology
PHIL 511	(3)	Seminar: Philosophy of Logic and Mathematics

Psychology

List A/B:

ANTH 440	(3)	Cognitive Anthropology
MUMT 250	(3)	Music Perception and Cognition

NSCI 201	(3)	Introduction to Neuroscience 2
PSYC 204	(3)	Introduction to Psychological Statistics
PSYC 212	(3)	Perception
PSYC 213	(3)	Cognition
PSYC 301	(3)	Animal Learning & Theory
PSYC 304	(3)	Child Development
PSYC 305	(3)	Statistics for Experimental Design
PSYC 311	(3)	Human Cognition and the Brain
PSYC 315	(3)	Computational Psychology
PSYC 316	(3)	Psychology of Deafness
PSYC 318	(3)	Behavioural Neuroscience 2
PSYC 340	(3)	Psychology of Language
PSYC 341	(3)	The Psychology of Bilingualism
PSYC 352	(3)	Cognitive Psychology Laboratory
PSYC 353	(3)	Laboratory in Human Perception
PSYC 410	(3)	Special Topics in Neuropsychology
PSYC 413	(3)	Cognitive Development
PSYC 470	(3)	Memory and Brain
PSYC 522	(3)	Neurochemistry and Behaviour
PSYC 529	(3)	Music Cognition
PSYC 537	(3)	Advanced Seminar in Psychology of Language
PSYC 545	(3)	Topics in Language Acquisition
PSYC 561	(3)	Methods: Developmental Psycholinguistics

Neuroscience

List A/B:

* Students select either PHGY 311 or BIOL 306, but not both.

** Students select either BIOL 514 or PSYC 514, but not both.

*** Students select either NSCI 200 or PHGY 209, but not both.

ANAT 321	(3)	Circuitry of the Human Brain
BIOL 200	(3)	Molecular Biology
BIOL 201	(3)	Cell Biology and Metabolism
BIOL 306*	(3)	Neural Basis of Behaviour
BIOL 514**	(3)	Neurobiology Learning and Memory
BIOL 530	(3)	Advances in Neuroethology
BIOL 588	(3)	Advances in Molecular/Cellular Neurobiology
NEUR 310	(3)	Cellular Neurobiology
NSCI 200***	(3)	Introduction to Neuroscience 1
NSCI 201	(3)	Introduction to Neuroscience 2
NSCI 300	(3)	Neuroethics
PHGY 209***	(3)	Mammalian Physiology 1
PHGY 311*	(3)	Channels, Synapses & Hormones

PHGY 314	(3)	Integrative Neuroscience
PHGY 556	(3)	Topics in Systems Neuroscience
PSYC 211	(3)	Introductory Behavioural Neuroscience
PSYC 311	(3)	Human Cognition and the Brain
PSYC 317	(3)	Genes and Behaviour
PSYC 318	(3)	Behavioural Neuroscience 2
PSYC 342	(3)	Hormones and Behaviour
PSYC 410	(3)	Special Topics in Neuropsychology
PSYC 427	(3)	Sensorimotor Behaviour
PSYC 502	(3)	Psychoneuroendocrinology
PSYC 514**	(3)	Neurobiology of Learning and Memory
PSYC 522	(3)	Neurochemistry and Behaviour
PSYT 301	(3)	Issues in Drug Dependence
PSYT 500	(3)	Advances: Neurobiology of Mental Disorders

Research Courses

COGS 401	(6)	Research Cognitive Science 1
COGS 402	(6)	Research Cognitive Science 2

10.6 Computer Science

The School of Computer Science and the discipline are described under *Programs, Courses and University Regulations > Faculties & Schools > Faculty of Science > Undergraduate > Academic Programs (Faculty of Science) > : Computer Science (COMP).*

The following are considered Science programs in the B.A. & Sc.:

Minor Concentration in Computer Science
Major Concentration in Computer Science
Major Concentration in Software Engineering

The requirements of the Software Engineering program are described under the *Bachelor of Arts and Science* section while the requirements of the Computer Science programs are described under *Programs, Courses and University Regulations > Faculties & Schools > Faculty of Arts > Undergraduate > Academic Programs > : Computer Science (COMP).*

10.6.1 Bachelor of Arts and Science (B.A. & Sc.) - Major Concentration Software Engineering (37 credits)

The Major Concentration Software Engineering focuses on the techniques and methodology required to design and develop complex software systems and covers the subject commonly known as "Software Engineering."

MATH 133, MATH 140, and MATH 141 (or their equivalents) must be completed prior to taking courses in this program.

Note: This program does not lead to certification as a Professional Engineer.

Required Courses (30 credits)

* Students who have sufficient knowledge in a programming language do not need to take COMP 202 and can replace it with additional computer science complementary course credits.

COMP 202*	(3)	Foundations of Programming
COMP 206	(3)	Introduction to Software Systems
COMP 250	(3)	Introduction to Computer Science
COMP 251	(3)	Algorithms and Data Structures
COMP 273	(3)	Introduction to Computer Systems

COMP 302	(3)	Programming Languages and Paradigms
COMP 303	(3)	Software Development
COMP 421	(3)	Database Systems
MATH 223	(3)	Linear Algebra
MATH 240	(3)	Discrete Structures 1

Complementary Courses (7 credits)

6-7 credits from:

COMP 322	(1)	Introduction to C++
COMP 361D1	(3)	Software Engineering Project
COMP 361D2	(3)	Software Engineering Project
COMP 529	(4)	Software Architecture
COMP 533	(3)	Object-Oriented Software Development

or any computer science course at the 300 level or above, excluding COMP 364, COMP 396, and COMP 400.

10.7 Earth, Atmosphere and Ocean Sciences

The following departments jointly offer a B.A. & Sc. program:

Atmospheric and Oceanic Sciences (ATOC)
Earth and Planetary Sciences (EPSC)

The departments, the disciplines, and specific courses are described in their respective sections under *Programs, Courses and University Regulations* > *Faculties & Schools* > *Faculty of Science* .

10.7.1 Bachelor of Arts and Science (B.A. & Sc.) - Major Concentration Earth, Atmosphere and Ocean Sciences (36 credits)

The Major Concentration Earth, Atmosphere and Ocean Sciences, which is restricted to students in the B.A. & Sc., is a sequence of courses designed to permit a degree of specialization in these disciplines.

Required Courses (18 credits)

ATOC 214	(3)	Introduction: Physics of the Atmosphere
ATOC 215	(3)	Oceans, Weather and Climate
ATOC 309	(3)	Weather Radars and Satellites
ATOC 315	(3)	Thermodynamics and Convection
EPSC 210	(3)	Introductory Mineralogy
EPSC 212	(3)	Introductory Petrology

Complementary Courses (18 credits)

A minimum of 18 credits, at least 6 of which must be at the 300 level or higher, distributed as follows:

3 credits from:

EPSC 201	(3)	Understanding Planet Earth
EPSC 233	(3)	Earth and Life History

9 credits from:

EPSC 203	(3)	Structural Geology
EPSC 220	(3)	Principles of Geochemistry
EPSC 231	(3)	Field School 1
EPSC 320	(3)	Elementary Earth Physics
EPSC 331	(3)	Field School 2
EPSC 341	(3)	Field School 3
EPSC 425	(3)	Sediments to Sequences
EPSC 455	(3)	Sedimentary Geology
EPSC 542	(3)	Chemical Oceanography
EPSC 549	(3)	Hydrogeology

6 credits from:

ATOC 219	(3)	Introduction to Atmospheric Chemistry
ATOC 412	(3)	Atmospheric Dynamics
GEOG 308	(3)	Principles of Remote Sensing

10.8 Environment

The requirements for the B.A. & Sc. Interfaculty Program and the Honours Program in Environment are described in detail under *Programs, Courses and University Regulations > Faculties & Schools > McGill School of Environment* .

See *Programs, Courses and University Regulations > Faculties & Schools > McGill School of Environment > Undergraduate > : Bachelor of Arts and Science (B.A. & Sc.) – Interfaculty Program in Environment* or see *Programs, Courses and University Regulations > Faculties & Schools > McGill School of Environment > Undergraduate > : Honours Program in Environment*.

10.9 Geography (GEOG)

The Department of Geography, the discipline, and specific courses are described under *Programs, Courses and University Regulations > Faculties & Schools > Faculty of Science > Undergraduate > Academic Programs (Faculty of Science) > : Geography (GEOG)*.

Note: students may take a Geography program either in Arts or in Science, but not in both.

The following are considered Arts programs in the B.A. & Sc. and are described under *Programs, Courses and University Regulations > Faculties & Schools > Faculty of Arts > Undergraduate > Academic Programs > : Geography (GEOG)*:

Major Concentration in Geography
Major Concentration in Geography (Urban Systems)
Minor Concentration in Geography
Minor Concentration in Geography (Urban Systems)

The following are considered Science programs in the B.A. & Sc. (Major Concentration) and are described either under *Bachelor of Arts and Science* or under *Programs, Courses and University Regulations > Faculties & Schools > Faculty of Science > Undergraduate > Academic Programs (Faculty of Science) > : Geography (GEOG)* (Minors):

Major Concentration in Geography (Physical Geography)
Minor in Geographic Information Systems and Remote Sensing
Minor in Geography

10.9.1 Bachelor of Arts and Science (B.A. & Sc.) - Interfaculty Program in Sustainability, Science and Society (54 credits)

The grand challenge of the 21st century is Sustainable Well-being; that is, to improve human well-being while maintaining the Earth's life-support systems. This B.A. & Sc. program provides the inter-disciplinary and integrative knowledge and skills required to effectively understand and address this challenge in its multiple dimensions - scientific-technological, socio-economic, political-institutional, ethical, and human behavioural - and to chart a transition to sustainability. It is built upon three pillars: 1) Science and Technology, to provide an in-depth understanding of the underpinnings of the problems of concern along these dimensions; 2) Economics, Policy, and Governance, to understand how we can make the Sustainability transition; and 3) Ethics, Equity, and Justice, to discuss why we need change, and the issues of equity and justice associated with taking action. This program is a partnership between Geography and the MSE and will be administered through Geography.

Required Courses (27 credits)

27 credits selected as follows:

Foundations of Sustainability

9 credits selected from Foundations of Sustainability as follows:

ENVR 201	(3)	Society, Environment and Sustainability
GEOG 360	(3)	Analyzing Sustainability
GEOG 460	(3)	Research in Sustainability

Biophysical, Societal, Cultural, Institutional, and Ethical

18 credits from introduction to biophysical, societal, cultural, institutional, and ethical dimensions of sustainability.

ENVR 200	(3)	The Global Environment
ENVR 202	(3)	The Evolving Earth
ENVR 203	(3)	Knowledge, Ethics and Environment
GEOG 203	(3)	Environmental Systems
GEOG 310	(3)	Development and Livelihoods
MGPO 440	(3)	Strategies for Sustainability

Complementary Courses (27 credits)

27 credits selected as follows:

3 credits of Statistics

3 credits of System Modelling tools

3 credits of Economics

18 credits selected from 3 areas

Statistics

3 credits of Statistics from the following:

AEMA 310	(3)	Statistical Methods 1
BIOL 373	(3)	Biometry
GEOG 202	(3)	Statistics and Spatial Analysis
PSYC 204	(3)	Introduction to Psychological Statistics

System Modelling

3 credits of System Modelling tools from the following:

ESYS 301	(3)	Earth System Modelling
GEOG 501	(3)	Modelling Environmental Systems

Economics

3 credits of Economics from the following:

AGEC 333	(3)	Resource Economics
ECON 225	(3)	Economics of the Environment
ECON 326	(3)	Ecological Economics

18 additional credits of complementary courses chosen from 3 areas listed below:

Students must choose at least two courses from each area, and in total complete at least 9 credits at the 300 level or higher.

AREA 1: Methods: Observation, Analysis, Modelling, and Management

AGRI 435	(3)	Soil and Water Quality Management
ENVB 437	(3)	Assessing Environmental Impact
ENVR 544	(3)	Environmental Measurement and Modelling
ESYS 500	(3)	Earth System Applications
GEOG 201	(3)	Introductory Geo-Information Science
GEOG 302	(3)	Environmental Management 1
GEOG 306	(3)	Raster Geo-Information Science
GEOG 308	(3)	Principles of Remote Sensing
GEOG 351	(3)	Quantitative Methods
GEOG 404	(3)	Environmental Management 2
GEOG 509	(3)	Qualitative Methods
GEOG 523	(3)	Global Ecosystems and Climate
URBP 506	(3)	Environmental Policy and Planning

AREA 2: Society, Economics, Policy, Ethics, and Equity

Take at least one course from each subsection (2A and 2B) below:

2A: Society, Economics, and Policy

Note:

* Students select either AGEC 200 or ECON 208, but not both.

** Students may select either AGEC 201 or ECON 209, but not both.

AGEC 200*	(3)	Principles of Microeconomics
AGEC 201**	(3)	Principles of Macroeconomics
AGEC 430	(3)	Agriculture, Food and Resource Policy
AGEC 442	(3)	Economics of International Agricultural Development
ANTH 206	(3)	Environment and Culture
ANTH 212	(3)	Anthropology of Development
ANTH 339	(3)	Ecological Anthropology
ECON 208*	(3)	Microeconomic Analysis and Applications
ECON 209**	(3)	Macroeconomic Analysis and Applications
ECON 230	(6)	Microeconomic Theory
ECON 347	(3)	Economics of Climate Change
ECON 405	(3)	Natural Resource Economics

ENVR 519	(3)	Global Environmental Politics
GEOG 210	(3)	Global Places and Peoples
GEOG 216	(3)	Geography of the World Economy
GEOG 303	(3)	Health Geography
GEOG 316	(3)	Political Geography
GEOG 408	(3)	Geography of Development
GEOG 410	(3)	Geography of Underdevelopment: Current Problems
GEOG 508	(3)	Resources, People and Power
GEOG 514	(3)	Climate Change Vulnerability and Adaptation
HIST 292	(3)	History and the Environment
MGCR 360	(3)	Social Context of Business
MGPO 475	(3)	Strategies for Developing Countries
MGPO 567	(3)	Business in Society
NRSC 540	(3)	Socio-Cultural Issues in Water
URBP 530	(3)	Urban Environmental Planning

2B: Ethics and Equity

ENVR 400	(3)	Environmental Thought
GEOG 382	(3)	Principles Earth Citizenship
MGPO 450	(3)	Ethics in Management
RELG 270	(3)	Religious Ethics and the Environment

AREA 3: Sustainability and Biophysical Processes

Note:

* Students select either BREE 217 or GEOG 322, but not both.

** Students select either BIOL 540 or ENVR 540, but not both.

ATOC 214	(3)	Introduction: Physics of the Atmosphere
ATOC 215	(3)	Oceans, Weather and Climate
BIOL 308	(3)	Ecological Dynamics
BIOL 310	(3)	Biodiversity and Ecosystems
BIOL 540**	(3)	Ecology of Species Invasions
BREE 217*	(3)	Hydrology and Water Resources
ENVB 410	(3)	Ecosystem Ecology
ENVR 540**	(3)	Ecology of Species Invasions
ESYS 200	(3)	Earth System Processes
ESYS 300	(3)	Investigating the Earth System
GEOG 221	(3)	Environment and Health
GEOG 305	(3)	Soils and Environment
GEOG 322*	(3)	Environmental Hydrology
GEOG 372	(3)	Running Water Environments
GEOG 403	(3)	Global Health and Environmental Change
GEOG 470	(3)	Wetlands

GEOG 530	(3)	Global Land and Water Resources
GEOG 555	(3)	Ecological Restoration
NRSC 333	(3)	Pollution and Bioremediation

Students who wish to explore the following topics in more depth may select the courses listed below:

1) Climate Change: ESYS 200, ESYS 300, ESYS 500, GEOG 523, ATOC 214, ATOC 215

2) Land Resources, Food, Forests: AGEC 430, AGEC 442, AGRI 435, BIOL 308, BIOL 310, ENVB 410, GEOG 523, GEOG 530

3) Water Resources: AGRI 435, NRSC 540, BREE 217, GEOG 322, GEOG 372, GEOG 470, GEOG 530

4) Biodiversity: BIOL 308, BIOL 310, BIOL 540, ENVB 410, ENVR 540, GEOG 555

5) Human Health: GEOG 221, GEOG 303, GEOG 403

6) Development: GEOG 408, GEOG 410, ANTH 212

10.9.2 Bachelor of Arts and Science (B.A. & Sc.) - Major Concentration Geography - Physical Geography (36 credits)

The Major Concentration Geography - Physical Geography, which is restricted to students in the B.A. & Sc., is a planned sequence of courses designed to permit a degree of specialization in this discipline.

Required Courses (12 credits)

GEOG 201	(3)	Introductory Geo-Information Science
GEOG 202	(3)	Statistics and Spatial Analysis
GEOG 203	(3)	Environmental Systems
GEOG 272	(3)	Earth's Changing Surface

Complementary Courses (24 credits)

Courses are selected as follows:

6 credits of analytical techniques are selected from:

GEOG 306	(3)	Raster Geo-Information Science
GEOG 307	(3)	Socioeconomic Applications of GIS
GEOG 308	(3)	Principles of Remote Sensing
GEOG 351	(3)	Quantitative Methods

3 credits of field courses selected from:

GEOG 495	(3)	Field Studies - Physical Geography
GEOG 496	(3)	Geographical Excursion
GEOG 497	(3)	Ecology of Coastal Waters
GEOG 499	(3)	Subarctic Field Studies

9-15 credits in systematic physical geography selected from:

GEOG 305	(3)	Soils and Environment
GEOG 321	(3)	Climatic Environments
GEOG 322	(3)	Environmental Hydrology
GEOG 372	(3)	Running Water Environments
GEOG 470	(3)	Wetlands

0-6 credits in integrative and advanced topics selected from:

GEOG 302	(3)	Environmental Management 1
GEOG 501	(3)	Modelling Environmental Systems
GEOG 505	(3)	Global Biogeochemistry
GEOG 506	(3)	Advanced Geographic Information Science
GEOG 536	(3)	Geocryology
GEOG 537	(3)	Advanced Fluvial Geomorphology
GEOG 550	(3)	Historical Ecology Techniques
GEOG 555	(3)	Ecological Restoration

10.10 Mathematics

The requirements for the B.A. & Sc. Major Concentration in Mathematics are described in detail under *Programs, Courses and University Regulations > Faculties & Schools > Faculty of Arts > Undergraduate > Academic Programs > : Mathematics and Statistics (MATH)*.

10.11 Physics (PHYS)

The Department of Physics, the discipline, and specific courses are described under *Programs, Courses and University Regulations > Faculties & Schools > Faculty of Science > Undergraduate > Academic Programs (Faculty of Science) > : Physics (PHYS)*.

10.11.1 Bachelor of Arts and Science (B.A. & Sc.) - Major Concentration Physics (36 credits)

The Major Concentration Physics, which is restricted to students in the B.A. & Sc. or B.Sc./B.Ed., is a planned sequence of courses designed to permit a degree of specialization in this discipline. This program is insufficient to prepare a student for professional or graduate work in physics; students interested in pursuing a career in physics are advised to take the appropriate B.Sc. program in physics.

Required Courses* (30 credits)

* Required courses taken at CEGEP or elsewhere that are not credited toward the B.A. & Sc. or B.Sc./B.Ed. must be replaced by courses from the Complementary Course List.

MATH 222	(3)	Calculus 3
MATH 223	(3)	Linear Algebra
MATH 314	(3)	Advanced Calculus
MATH 315	(3)	Ordinary Differential Equations
PHYS 230	(3)	Dynamics of Simple Systems
PHYS 232	(3)	Heat and Waves
PHYS 257	(3)	Experimental Methods 1
PHYS 333	(3)	Thermal and Statistical Physics
PHYS 340	(3)	Majors Electricity and Magnetism
PHYS 446	(3)	Majors Quantum Physics

Complementary Courses (6 credits)

6 credits selected from:

PHYS 214	(3)	Introductory Astrophysics
PHYS 224	(3)	Physics of Music
PHYS 241	(3)	Signal Processing

PHYS 258	(3)	Experimental Methods 2
PHYS 334	(3)	Advanced Materials
PHYS 534	(3)	Nanoscience and Nanotechnology

or any 300- or 400-level course approved by an adviser.

10.12 Psychology

The requirements for the B.A. & Sc. Major Concentration in Psychology, Joint Honours Component in Psychology and Minor Concentration in Psychology are described in detail under *Programs, Courses and University Regulations > Faculties & Schools > Faculty of Arts > Undergraduate > Academic Programs > : Psychology (PSYC)*.