Bachelor of Arts and Science

Programs, Courses and University Regulations

2010-2011

10.5.2 Faculty of Science,

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, Rooms 110 and 115. The SOUSA Office serves students in the B.A. & Sc. and B.Sc. degrees.

4.2 Administrative Officers

For a listing of administrative officers in the Faculty of Arts, refer to *Faculty of Arts > Administrative Officers* and for those in the Faculty of Science, refer to *Faculty of Science > 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)	
Bruce A. Arndtsen; B.A.(Car. College), Ph.D.(Stan.)	**Chemistry**
Hassan Benchekroun; Diplôme d'ingenieur d'etat(École Mohamedia des Ingenieurs, Morocco), Ph.D.(Laval)	**Economics**
André Costopoulos; B.A.(McG.), M.A.(Montr.), Ph.D.(Oulu)	**Anthropology**
Nick de Takacsy, B.Sc., M.Sc.(Montr.), Ph.D.(McG.) (*2010-2011*)	**Special Advisor, Faculty of Science**
Nicholas Dew, B.A., M.A., Ph.D. (Oxf.)	**History**
Laurie Hendren; B.Sc., M.Sc.(Qu.), Ph.D.(C'nell) (*on sabbatical 2010-2011*)	**Associate Dean (Academic), Faculty of Science**
Louis Lefebvre; B.Sc., M.A., Ph.D.(Montr.)	**Biology**
Suzanne Morton, B.A.(Trent), M.A., Ph.D. (Dal.)	**Associate Dean (Academic), Faculty of Arts**

4.3 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 *mailto: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/sousa*m(www)T3i13i0 0 1 67.52 296.9 Tm(a1ees811 0 0 1 71.903 209.395 Tm1ees811 0 0 ion about admission r0 0

5 Degree Admission Requirements

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

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 de

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 (ESLN)

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/courses/plan/transfer/. Students must carefully select their mathematics and science Freshman courses so that they have all the required prerequisites for their intended Departmental Programs.

6.5 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.

In all cases, the degree also includes a **required integrative course (BASC 201; 3 credits)**, a **complementary integrative course (3 credits)** within or outside a student's programs selected from the complementary list in Integrative Courses, plus electives (10-15 credits).

6.5.1 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 10: 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.

6.5.2 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 approv

To choose the Joint Honours option, you must meet the GPA/CGPA requirements set out in *University Regulations and Information > Graduation Honours: Honours and First-Class Honours*.

6.5.4 Interfaculty Program

An Interfaculty program is an approved selection of courses constituting a concentration in an intellectually coherent and inter-faculty field of studies. These courses must include approved selections from the Faculties of Arts and of Science and possibly other faculties. See *section 10.2: 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.

6.6 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

- 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 towards 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 *University Regulations and Information > 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.

6.6.4 Courses in English as a Second Language

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.

6.6.5 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 the Arts section (see *Faculty of Arts > First-Year Seminar Courses*) and the Science section (see *Faculty of Science > Registration for First-Year Seminars*) of this publication.

7 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: *University Regulations and Information > Registration* and *University Regulations and Information > Undergraduate Advising*; *Welcome to McGill*, which you receive upon acceptance from Enrolment Services; as well as information posted on the SOUSA website, *www.mcgill.ca/science/sousa* 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 *Welcome to McGill* which you receive upon acceptance from Enrolment Services, as well as the SOUSA website, *www.mcgill.ca/science/sousa*.

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/sousa*.

7.1 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 6 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

Multi-track System

other. Additional guidelines for the multi-track system can be found in *section 6.5: 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 the *Faculty of Arts* section of this publication.

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*.

9 Examinations

You should see *University Regulations and Information > Examinations: General Information* for information about final examinations and deferred examinations.

The exam schedules are posted on the McGill website, *www.mcgill.ca/students*, 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.

10 Overview of Programs Offered

- *Major Concentrations*; see *section 10.1: Major Concentrations*
- *Interfaculty Programs*; see *section 10.2: Interfaculty Programs*
- *Honours Programs*; see *section 10.3: Honours Programs*
- *Joint Honours Programs*; see *section 10.4: Joint Honours Programs*
- *Minor Concentrations or Minors*; see *section 10.5: Minor Concentrations or Minors*
- *Integrative Courses*; see *section 10.6: Integrative Courses*

10.1 Major Concentrations

10.1.1 Faculty of Arts

The Arts Major Concentrations available to B.A. & Sc. students are listed here and are described in detail under the *Faculty of Arts* section of this publication. 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

10.2 Interfaculty Programs

The Interfaculty programs available to B.A. & Sc. students are listed here and are described in detail either under the *Bachelor of Arts & Science* (AS) section or under the *McGill School of Environment* (E) section of this publication as indicated.

Revision, Fall 2010. Start of revision.

Cognitive Science (AS), *section 11.6.3: Bachelor of Arts and Science (B.A. & Sc.) - Interfaculty Program Cognitive Science (54 credits)*

Environment (E), see *McGill School of Environment > Bachelor of Arts and Science (B.A. & Sc.) - Interfaculty Program in Environment*

Sustainability, Science and Society (AS), *section 11.10.1: Bachelor of Arts and Science (B.A. & Sc.) - Interfaculty Program in Sustainability, Science and Society (54 credits)*

Revision, Fall 2010. End of revision.

10.3 Honours Programs

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

- The Honours Program in Environment is described in detail in this publication under *McGill School of Environment > Honours Program in Environment*.
- The Honours Program in Cognitive Science is described in detail in *section 11.6: Cognitive Science*.

Students interested in an Honours degree should also consider the Joint Honours Programs; see *section 10.4: Joint Honours Programs*.

10.4 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).

10.4.1 Faculty of Arts

The Arts Joint Honours components available to B.A. & Sc. students are listed here and are described in detail under the *Faculty of Arts* section of this publication.

Anthropology; see *Faculty of Arts > Bachelor of Arts (B.A.) - Joint Honours Component Anthropology (36 credits)*

Art History; see *Faculty of Arts > Bachelor of Arts (B.A.) - Joint Honours Component Art History (36 credits)*

Canadian Studies; see *Faculty of Arts > Bachelor of Arts (B.A.) - Joint Honours Component Canadian Studies (36 credits)*

Classics; see *Faculty of Arts > Bachelor of Arts (B.A.) - Joint Honours Component Classics (36 credits)*

East Asian Studies; see *Faculty of Arts > Bachelor of Arts (B.A.) - Joint Honours Component East Asian Studies (36 credits)*

Economics; see *Faculty of Arts > Bachelor of Arts (B.A.) - Joint Honours Component Economics (30 credits)*

English – Cultural Studies; see *Faculty of Arts > Bachelor of Arts (B.A.) - Joint Honours Component English – Cultural Studies (36 credits)*

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

English – Literature; see *Faculty of Arts > Bachelor of Arts (B.A.) - Joint Honours Component English – Literature (36 credits)*

Geography; see *Faculty of Arts > Bachelor of Arts (B.A.) - Joint Honours Component Geography (36 credits)*

German Studies; see *Faculty of Arts > Bachelor of Arts (B.A.) - Joint Honours Component German (36 credits)*

Hispanic Studies; see *Faculty of Arts > Bachelor of Arts (B.A.) - Joint Honours Component Hispanic Studies (36 credits)*

History; see *Faculty of Arts > Bachelor of Arts (B.A.) - Joint Honours Component History (36 credits)*

International Development Studies; see *Faculty of Arts > Bachelor of Arts (B.A.) - Joint Honours Component International Development Studies (36 credits)*

Italian Studies; see *Faculty of Arts > Bachelor of Arts (B.A.) - Joint Honours Component Italian Studies (36 credits)*

East Asian Language and Literature; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration East Asian Language and Literature (18 credits)*

East Asian Cultural Studies; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration East Asian Cultural Studies (18 credits)*

East Asian Studies, Advanced; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration Advanced East Asian Studies (18 credits)*

Economics; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration Economics (18 credits)*

English – Cultural Studies; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration English – Cultural Studies (18 credits)*

English – Drama and Theatre; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration English – Drama and Theatre (18 credits)*

English – Literature; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration English – Literature (18 credits)*

Geography; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration Geography (18 credits)*

Geography (Urban Systems); see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration Geography (Urban Systems) (18 credits)*

German Language; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration German Language (18 credits)*

German Literature; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration German Literature (18 credits)*

German Literature and Culture in Translation; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration German Literature and Culture in Translation (18 credits)*

Hispanic Languages; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration Hispanic Languages (18 credits)*

Hispanic Literature and Culture; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration Hispanic Literature and Culture (18 credits)*

History; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration History (18 credits)*

History and Philosophy of Science; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration History and Philosophy of Science (18 credits)*

International Development Studies; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration International Development Studies (18 credits)*

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

Islamic Studies; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration Islamic Studies (18 credits)*

Italian Studies; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration Italian Studies (18 credits)*

Jewish Law; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration Jewish Law (18 credits)*

Jewish Studies; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration Jewish Studies (18 credits)*

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

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

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

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

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

Linguistics; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration Linguistics (18 credits)*

Middle East Languages; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration Middle East Languages (18 credits)*

Middle East Studies; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration Middle East Studies (18 credits)*

North American Studies; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration North American Studies (18 credits)*

Philosophy; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration Philosophy (18 credits)*

Philosophy and Western Religions; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration Philosophy and Western Religions (18 credits)*

Political Economy; see *Faculty of Arts > Political Science (POLI) > Bachelor of Arts (B.A.) - Minor Concentration Political Economy (18 credits)*

Political Science; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration Political Science (18 credits)*

Political Science: Canada/Quebec; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration Political Science Canada/Quebec (18 credits)*

Political Theory; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration Political Theory (18 credits)*

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

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

Russian; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration Russian (18 credits)*

Russian Culture; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration Russian Culture (18 credits)*

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

Sexual Diversity Studies; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration Sexual Diversity Studies (18 credits)*

Social Studies of Medicine; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration Social Studies of Medicine (18 credits)*

Sociology; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration Sociology (18 credits)*

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

Women's Studies; see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration Women's Studies (18 credits)*

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

10.5.2 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 the *Faculty of Science* (S) or *Faculty of Arts* (A), or *Bachelor of Arts & Science* (AS) section of this publication as indicated.

Atmospheric Science (M-S); see *Faculty of Science > Bachelor of Science (B.Sc.) - Minor Atmospheric Science (18 credits)*

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

Biology – Organismal (MC-AS); see *Bachelor of Arts & Science > Bachelor of Arts and Science (B.A. & Sc.) - Minor Concentration Biology - Organismal (19 credits)*

Chemistry (M-S); see *Faculty of Science > Bachelor of Science (B.Sc.) - Minor Chemistry (18 credits)*

Computer Science (MC-A); see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration in Computer Science (18 credits)*

Environment (M-S); see *McGill School of Environment > 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 (M-S); see *Faculty of Science > Bachelor of Science (B.Sc.) - Minor Geographic Information Systems (18 credits)*

Geography (M-S); see *Faculty of Science > Bachelor of Science (B.Sc.) - Minor Geography (18 credits)*

Geology (M-S); see *Faculty of Science > Bachelor of Science (B.Sc.) - Minor Geology (18 credits)* (*previously named Earth and Planetary Sciences*)

Interdisciplinary Life Sciences (M-S); see *Faculty of Science > Bachelor of Science (B.Sc.) - Minor Interdisciplinary Life Sciences (24 credits)*

Mathematics (MC-A); see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration Mathematics (18 credits)*

Physics (M-S); see *Faculty of Science > Bachelor of Science (B.Sc.) - Minor Physics (18 credits)*

Psychology (MC-A); see *Faculty of Arts > Bachelor of Arts (B.A.) - Minor Concentration Psychology (18 credits)*

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

10.6 Integrative Courses

10.6.1 Required Integrative Course

BASC 201	Arts & Science Integrative Topics

10.6.2 Complementary Integrative Course

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

ANTH 201	(3)	Prehistoric Archaeology
ANTH 203	(3)	Human Evolution
ANTH 208	(3)	Evolutionary Anthropology
		Medical

HIST 424	(3)	Gender, Sexuality & Medicine
LING 390	(3)	Neuroscience of Language
LING 555	(3)	Language Acquisition 2
		Computability and Mathem91 0 0 1 221vee3)

11.3 Biology (BIOL)

The Department of Biology, the discipline, and specific courses are described under the *Faculty of Science* section of this publication.

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.

11.3.1 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 course.

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 biology course at the 300-level or higher approved by an adviser.

11.3.2 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 biology course at the 300-level or higher approved by an adviser.

11.3.3 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.

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
		Introductory Or

11.5 Chemistry (CHEM)

The Department of Chemistry, the discipline, and specific courses are described under the *Faculty of Science* section of this publication.

The Major Concentration in 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 6.4: Bachelor of Arts and Science (B.A. & Sc.) - Freshman Program (30 credits)*).

11.5.1 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

11.6 Cognitive Science

11.6.1 Location

Ian Gold
Director, Program in Cognitive Science
3465 Peel Street, Room 401

Interdisciplinary Programs Adviser
Wendy Brett
Email: *mailto:wendy.brett@mcgill.ca*
Telephone: 514-398-7330

Website: *http://www.mcgill.ca/cogsci*

11.6.2 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 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.

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)	Introduction to Computing 1
COMP 206	(3)	Introduction to Software Systems
COMP 250	(3)	Introduction to Computer Science
COMP 251	(3)	Data Structures and Algorithms
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)	Theoretical Aspects: Computer Science
COMP 360	(3)	Algorithm Design Techniques
COMP 400	(3)	Technical Project and Report
COMP 409	(3)	Concurrent Programming
COMP 417	(3)	Introduction Robotics and Intelligent Systems
COMP 421	(3)	Database Systems
COMP 490	(3)	Introduction to Probabilistic Analysis of Algorithms
COMP 526	(3)	Probabilistic Reasoning and AI
COMP 531	(3)	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
		Behavioural Neurof Deafnes/S
		Psychology of Language/S
		The Psychology of Bilingualism/S
		Cognitive Psychology Laboratory
		Laboratory in Human Perception
		Special Topics in Neuropsychology
		Cognitive Development
		Memory and Brain
		Neurochemistry and Behaviour
		Music Cognition
		Advaafnd Seminar in Psychology of Language/S
		Topics in Language Acquisition
		Methods: Developmental Psycholinguistics

		Molecular Biology
		Cell Biology and Metabolism/S
		Neural Basis of Behaviour
		Neurobiology Learning and Memory
		Advaafns in Neuroethology

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 410viour	(3)	PSY2 317(3)PS50 342 Special Topics in Neuropsychology

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)	Data Structures and Algorithms
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)	Theoretical Aspects: Computer Science
COMP 360	(3)	Algorithm Design Techniques
COMP 400	(3)	Technical Project and Report
COMP 409	(3)	Concurrent Programming
COMP 417	(3)	Introduction Robotics and Intelligent Systems
COMP 421	(3)	Database Systems
COMP 490	(3)	Introduction to Probabilistic Analysis of Algorithms
COMP 526	(3)	Probabilistic Reasoning and AI
COMP 531	(3)	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
		Behavioural Neurof Deafnes/S
		Psychology of Language/S
		The Psychology of Bilingualism/S
		Cognitive Psychology Laboratory
		Laboratory in Human Perception
		Special Topics in Neuropsychology
		Cognitive Development
		Memory and Brain
		Neurochemistry and Behaviour
		Music Cognition
		Advaafnd Seminar in Psychology of Language/S
		Topics in Language Acquisition
		Methods: Developmental Psycholinguistics

		Molecular Biology
		Cell Biology and Metabolism/S
		Neural Basis of Behaviour
		Neurobiology Learning and Memory
		Advaafns in Neuroethology

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

Revision, Fall 2010. End of revision.

11.7 Computer Science

The School of Computer Science and the discipline are described under *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

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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 431.

11.8 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 *Faculty of Science*.

11.8.1 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)	Water in the Atmosphere
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

11.9 Environment

The requirements for the B.A. & Sc. Interfaculty Program and the Honours Program in Environment are described in detail under *McGill School of Environment*. See *McGill School of Environment > Bachelor of Arts and Science (B.A. & Sc.) - Interfaculty Program in Environment* or see *McGill School of Environment > Honours Program in Environment*.

11.10 Geography (GEOG)

The Department of Geography, the discipline, and specific courses are described under the *Faculty of Science* section of this publication.

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 the *Faculty of Arts* section of this publication:

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 the *Bachelor of Arts and Science* section or under the *Faculty of Science* section (Minors) of this publication:

Major Concentration in Geography (Physical Geography)
Minor in Geographical Information Systems
Minor in Geography

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

Revision, Fall 2010. Start of revision. New program.

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 from section A and B 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 listed below

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 300 or higher level.

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

AGRI 435	(3)	Soil and Water Quality Management
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
NRSC 437	(3)	Assessing Environmental Impact
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
HIST 292	(3)	History and the Environment

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

The Major Concentration 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

11.11 Mathematics

The requirements for the B.A. & Sc. Major Concentration in Mathematics are described in detail under *Faculty of Arts > Mathematics and Statistics (MATH)*.

11.12 Physics (PHYS)