

# Proposed BSc Liberal Degree Program

## Faculty of Science, McGill University

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During the discussions in the program review of the Faculty, Major and Honours programs, two important themes are emerging.

- replacing (improving) the Faculty program with a more general-purpose and more clearly defined BSc Liberal degree.
- ensuring that all BSc degrees have appropriate programs which have a core plus depth or a core plus breadth.

Our Majors and Honours programs already provide excellent programs with core plus depth, but we do not have an adequate program for core plus breadth. By replacing the Faculty programs with a new BSc Liberal program we can provide a very flexible system that provides core plus breadth in a systematic and modular way.

## 1 The BSc Liberal - Basic Idea

The main idea is to introduce a new BSc Liberal program which would allow students to combine a 45-49 credit *core science component (CSC)* with a *breadth component (BC)* of at least 18 credits. The CSC would provide a core of one Science area, while the breadth component would allow for many options including minors in a wide variety of other disciplines, field studies, or a general Science breadth component. Details of the proposed degree are given in Section 3.

## 2 Motivation and Rationale

The motivation of the BSc Liberal degree comes from several sources.

- Many Faculty Programs from Science departments have very low enrollment and their purpose is not well defined. Some programs are “lighter” versions of one discipline, such as Biology, whereas others are multi-disciplinary.

The number of students (across all years) currently enrolled in a Faculty Programs is given in Table 1.

The Faculty Programs in Biology, plus the four biomed departments are more popular, but we can distill the essence of these programs into the more general BSc Liberal program - hence keeping the same sort of options for students in those fields, but making things more flexible across all disciplines. The case of Anatomy and Cell Biology is particularly important since it accounts for almost half of all Faculty program students.

Subject	Total
Anatomy and Cell Biology	136
Biochemistry	51
Microbiology & Immunology	14
Physiology	48
Biology	45
Biology and Mathematics	6
Chemistry	5
Chemistry & Biological Sci	1
Chemistry & Mathematics	2
Math, Chemistry & Physics	1
Math, Stats & Computer Sci	3
Math and Computer Sci	0
Physics	0
Psychology (closed)	9
Grand Total	322

Figure 1: Enrollment in Faculty Programs as of October 2006. Data from the Data Warehouse, looking at first major only.

- The large student interest in the BA&Sc program shows that students want a program with the option of doing more than one discipline. The BSc Liberal degree would provide a viable alternative for such students who want a Science degree, but also want to have another component. The BSc Liberal degree is actually broader than the BA&Sc focus since the breadth component encompasses not only Arts, but also minors in Education, Engineering, Field Studies, Kinesiology, Management or Music.
- Many members in the Faculty of Science seem to find the 36 credit major concentrations as currently offered in the BA&Sc and BA degrees to be too small for many Science areas. This is at least partly due to the fact that many Science disciplines need a fair number of introductory courses in order to form a solid base. Therefore, we need something that has a larger core. It is suggested that the BSc Liberal have a Science major component of 45-49 credits as a reasonable compromise between the need to form a core and the need to leave room for the breadth component. This number corresponds quite closely to the core part of existing Faculty programs.

The BA&Sc biomed major concentration is currently problematic because it attempts to cover a broad area with only 36-38 credits. This means that students can not proceed to many higher level classes. If the BSc Liberal program was introduced it *may* make sense to remove the biomed major concentration from the BA&Sc program and instead advise students interested in a broad degree to follow a BSc Liberal program with a CSC in one of the biomed areas.

- By combining a core science component with a breadth component, we create a very flexible program that ensures that students have a core knowledge of at least one area and some breadth. Hence the Liberal degree is still a solid degree - it just trades some depth for breadth.
- There are numerous very interesting minors available to our Science students, including minors in Arts, Kinesiology, other Science areas, Education, Engineering, Biotechnology and

Management. There are also several new and very interesting minors in various stages of development outside of Science including new minors from Management including a Minor in Finance and a Minor in Marketing and potentially new minors from the Schulich School of Music.<sup>1</sup>

More than 1/3 of the students in the Faculty programs currently complete at least one minor. Table 2 summarizes the first minor of all students currently in Faculty programs. Thus, we can assume that the option of using a minor as a breadth requirement will be reasonably popular.

- We do not want to change our Major, Joint Major, Honours and Joint Honours programs very much. They are very popular and they enforce core knowledge plus some depth. The BSc Liberal program should be seen as an alternative, not a replacement, to these existing programs. There is no intention to push these programs at the expense of the Major and Honours programs, nor any intent to increase enrollment due to the introduction of this program. There is a possibility that the BSc Liberal degree may be an attractive alternative for some students currently opting for the BA&Sc degree.

The main point is that the Faculty of Science should offer something for all types of students, from very specialized honours programs to broader Liberal degrees which allow students to broaden their studies both inside and outside of Science.

- If defined properly, it should be possible for students to switch between the BSc Liberal and BSc Major programs as their interests change. Students may start out in the Liberal program only to find out they really love a particular discipline and thus change to the Major. Conversely, students may start out in the Major program and find a second program they also love, so they might change to the Liberal program and do a Minor or Major Concentration in the other discipline.
- The BSc Liberal degree would be fairly easy to implement. We already have all of the Minors in place, so that what needs to be done is to define the Core Science Components for each discipline.

### 3 BSc Liberal Program Details

The B.Sc. Liberal program is 90 credits including two required components: a *core science component* (CSC) (45-49 credits) and a *breadth component* (at least 18 credits). The remaining credits, to a total of 90, may be taken as electives.

Each department will offer a core science component of 45-49 credits. Students entering U1 of a BSc Liberal Program must specify which core science component they are choosing and these students will be associated with the matching department in terms of advising, administration, membership in departmental societies, recommendation for graduation and so on.

The breadth component can be satisfied in many ways. By the time students are entering U2 they should specify which option they are following, and should register this option on Minerva. In the case of the *general science breadth* option and the *field study semester* option, a program of study should be approved by the CSC departmental advisor.

**Minor Programs Available to Science Students (18-24 credits):** This includes any minor program available to Science students as listed in the calendar. At least 18 credits must be distinct from courses used to satisfy the CSC. As of Fall 2006, the list of minors includes:

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<sup>1</sup>In order to fully take advantage of Music minors we will have to revisit the current Faculty of Science restrictions on which Music courses may be taken for credit.

Minor	Total
Anthropology	3
Art History	6
Biology	3
Biotechnology	4
Chemistry	4
East Asian Language & Lit	2
Economics	2
Education for Science Students	6
English - Literature	4
Environment	4
Geography	1
Hispanic Lit and Culture	1
History	3
Human Nutrition	1
Humanistic Studies	1
Intl Development Studies	1
Ital Lang & Lit	1
Italian Civilization	1
Jewish Studies	1
Kinesiology	8
Lang et lit fr-Lett & trad	1
Lang et litt fr-Lang franc	1
Linguistics	1
Management	7
Mathematics	1
Middle East Languages	1
Music	1
Neuroscience	9
Pharmacology	17
Political Science	1
Psychology	10
Social Studies of Medicine	7
Sociology	1
Statistics	1
Women's Studies	1
World Religions	2
No Minor	203
Grand Total	322

Figure 2: Number of students taking Minors as of October 2006, data from the Data Warehouse, looking at only the 1st minor.

- Atmospheric Science
- Biology
- Biotechnology
- Chemical Engineering
- Chemistry
- Cognitive Science
- Computational Molecular Biology
- Computer Science
- Earth and Planetary Sciences
- Education for Science Students
- Electrical Engineering
- Environment
- Geochemistry
- Geography
- Geographical Information Systems
- Human Nutrition
- Kinesiology
- Management
- Mathematics
- Music Technology
- Neuroscience
- Pharmacology
- Physics
- Psychology
- Statistics
- Technological Entrepreneurship for Science Students

**Arts Minor Concentration (18 credits):** This includes all Arts minor concentrations available to Science students as listed in section 11.11.10 of calendar. None of the 18 credits may overlap with the CSC.

**Field Studies (18 credits):** This option can be satisfied by completing one of the field study semesters (15 credits) plus a 3-credit course complementing the field study semester. As of Fall 2006 there are three field study semesters available, African, Barbados and Panama. Students following this option must have their complementary course approved by their departmental advisor (perhaps in consultation with the field study semester's academic advisor).

**Arts Major Concentration (36 credits):** This includes all Arts major concentrations available to Science students as listed in section 11.11.10 of calendar. Although the smaller 18 credit minor concentrations are sufficient to satisfy the breadth component, some students will wish to complete the larger major concentration, in which case the major concentration will appear on their official records.

**A CSC in a second area (45-49 credits):** This option is most likely to be used when combining two CSC which have some required courses in common. At least 24 credits must be distinct from the courses used to satisfy the primary CSC.

**General Science Breadth (18 credits):** This provides a flexible option for students who wish to design their own breadth component.

The general science breadth option consists of a collection of 18 credits of courses offered by the Faculty of Science, distinct from courses taken as part of the CSC, satisfying the following:

- (a) all credits must be from courses at the 200-level or above and must include either (i) at least 9 credits at the 300-level or above, and at least 9 credits outside of the CRC area; or (ii) at least 12 credits at the 300-level or above, and at least 6 credits outside of the CRC area.
- (b) none of the credits may be from "General Interest Courses". A list of "General Interest Courses" will be created. A general rule of thumb is that a course is **not** a general interest course if it listed as a required or complementary course in the major program.

This option is suitable for students who decide to move from a Major program to a BSc Liberal option. In this case students are likely to have already completed the 12 extra credits at the 300-level or above (that would have been part of the Major program) and would only have to complete the 6 credits from an area outside of the CSC. For exceptional cases, where the decision to move to the BSc Liberal program is made close to graduation time, small changes in the requirements for the breadth component could be approved by the Associate Dean (Student Affairs).

This option can also be used to simulate most of the existing biomed Faculty programs, providing a suitable replacement for them.

## 4 Defining the new Core Science Components

This should be reasonably easy. There are at least three approaches.

1. start from a Minor or BA&Sc concentration and add courses,
2. start from a Major and remove courses,
3. start from first principles, keeping in mind the guidelines below.

In designing the Core Science Components (CSC) we should keep in mind the following:

- The U1 year of such programs should allow for some courses in the student's breadth component (i.e. the U1 year should not include 30 credits of the CSC).
- The program must include all courses that cannot be reasonably completed in the U0 year. For example, if CHEM 212 (Organic Chemistry 1) is required for the program, then it should be an explicit requirement. For such cases it would be acceptable for students without CHEM 212 to complete a 49 credit CSC, and students with CHEM 212 (i.e. students entering from CEGEP with an equivalent course to CHEM 212) would receive exemption for that course, effectively only needing to complete 45 credits.
- The CSC should be easily expandable to the Major.
- The CSC should be structured so that students progress to a reasonable number of courses at the 300-level or above. This may mean that a CSC might have several possible tracks.

## 5 Schedule

- October AC meeting: initial discussion of degree and feedback. In this meeting the overall structure of the program, as outlined in Revision 1, was approved.
- November AC meeting: feedback from departments and CSC program proposals for each unit. Laurie Hendren is willing to meet with departmental academic committees to aid in this process. Interested departments should contact [christopher.johns@mcgill.ca](mailto:christopher.johns@mcgill.ca) to schedule a meeting.
- December AC meeting: firm proposal, including the final CSC for each unit, for consideration by the AC and, if passed, to present to the Faculty of Science December meeting.