



<p>1.0 Degree Title Please specify the two degrees for concurrent degree programs</p> <input type="text" value="B.Sc."/>	<p>2.0 Administering Faculty/Unit</p> <input type="text" value="Science"/>
<p>1.1 Major (Legacy= Subject)(30-char. max.)</p> <input type="text" value="Computer Science and Biology"/>	<p>Offering Faculty/Department</p> <input type="text" value="Science"/>
<p>1.2 Concentration (Legacy = Concentration/Option) If applicable to Majors only (30 char. max.)</p> <input type="text"/>	<p>3.0 Effective Term of Implementation (Ex. Sept. 2004 = 200409) Term</p> <input type="text" value="200809"/>
<p>1.3 Minor (with Concentration, if Applicable) (30 char. max.)</p> <input type="text"/>	

4.0 Rationale for new proposal

Life sciences are becoming increasingly quantitative, analytical, and integrative. The program fills an important gap in the undergraduate programs at McGill, as no existing program allows students to get a solid training in the two increasingly interconnected fields of Biology and Computer Science.

5.0 Program Information
Please check appropriate box(es)

<p>5.1 Program Type</p> <input checked="" type="checkbox"/> Bachelor's Program <input type="checkbox"/> Master's <input type="checkbox"/> M.Sc. (Applied) Program <input type="checkbox"/> Dual Degree/Concurrent Program <input type="checkbox"/> Certificate <input type="checkbox"/> Diploma <input type="checkbox"/> Graduate Certificate <input type="checkbox"/> Graduate Diploma <input type="checkbox"/> Ph.D. Program <input type="checkbox"/> Doctorate Program (Other than Ph.D.) <input type="checkbox"/> Private Program <input type="checkbox"/> Off-Campus Program <input type="checkbox"/> Distance Education Program (By Correspondence) <input type="checkbox"/> Other (Please specify) <input type="text"/>	<p>5.2 Category</p> <input type="checkbox"/> Faculty Program (FP) <input type="checkbox"/> Major <input checked="" type="checkbox"/> Joint Major <input type="checkbox"/> Major Concentration (CON) <input type="checkbox"/> Minor <input type="checkbox"/> Minor Concentration (CON) <input type="checkbox"/> Honours (HON) <input type="checkbox"/> Joint Honours Component (HC) <input type="checkbox"/> Internship/Co-op <input type="checkbox"/> Thesis (T) <input type="checkbox"/> Non-Thesis (N) <input type="checkbox"/> Other Please specify <input type="text"/>	<p>5.3 Level</p> <input checked="" type="checkbox"/> Undergraduate <input type="checkbox"/> Dentistry/Law/Medicine <input type="checkbox"/> Continuing Ed (Non-Credit) <input type="checkbox"/> Collegial <input type="checkbox"/> Masters & Grad Dips & Certs <input type="checkbox"/> Doctorate <input type="checkbox"/> Post-Graduate Medicine/Dentistry <input type="checkbox"/> Graduate Qualifying <input type="checkbox"/> Postdoctoral Fellows
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6.0 Total Credits

7.0 Consultation with Related Units Yes No

Financial Consult Yes No

Attach list of consultations.

8.0 Program Description (Maximum 150 words)

This program will train students in the fundamentals of biology – with a focus on molecular biology – and will give them computational and mathematical skills needed to manage, analyze, and model large biological datasets. The students take 50-54 credits of required courses, and 18 complementary credits. The required courses include 12 to 16 credits from existing Computer Science courses and 20 from existing Biology/Chemistry courses. Also, they will take: a three-credit joint Independent Studies course, co-supervised by a Biology professor and a Computer Science professor; a one-credit seminar course; BIOL 495, a three-credit new course entitled 'Integrative Computing in Biology'.

9.0 List of proposed program for the New Program/Major or Minor/Concentration.

If new concentration (option) of existing Major/Minor (program), please attach a program layout (list of all courses) of existing Major/Minor.

Proposed program (list courses as follows: Subj Code/Crse Num, Title, Credit weight under the headings of: Required Courses, Complementary Courses, Elective Courses)

Required Mathematics & Statistics Courses (12 credits)

MATH 222 (3) Calculus 3

MATH 223 (3) Linear Algebra

MATH 323 (3) Probability Theory **AND** MATH 324 (3) Statistics

OR

MATH 203 (3) Principle of Statistics 1 **AND** MATH 204 (3) Principle of Statistics 2

OR

BIOL 309 (3) Mathematical Models in Biology **AND** BIOL 373 (3) Biometry

Required Computer Science Courses (12, 15 or 16 credits)

COMP 202 (3) Intro to Computing 1 (*)

COMP 206 (3) Software Systems

COMP 250 (3) Intro to Computer Science

COMP 251 (3) Data Structures and Algorithms

COMP 462 (3) Computational Biology Methods

Or

561 (4) Computational Biology Methods

* Students who have sufficient knowledge in a programming language are not required to take COMP 202.

Required Biology Courses (20 credits)

CHEM 212 (4) Organic Chemistry

BIOL 200 (3) Molecular Biology

BIOL 201 (3) Cell Biology and Metabolism

BIOL 202 (3) Basic Genetics

BIOL 215 (3) Intro to Ecology and Evolution

BIOL 301 (4) Cell and Molecular Laboratory

Required Joint Courses (7 credits)

COMP 401 (3) Project in Biology and Computer Science **New Course**

COMP 499 (1) Undergraduate bioinformatics seminar **New Course**

BIOL 495 (3) Integrative Computing in Biology **New Course**

Complementary courses (18 credits)

At least 18 credits from the following lists, with the following two requirements:

- (1) 9 credits from each of the following two blocks
- (2) at least one course at the 400-level or above from each block.

Computer Science Block

MATH 240 (3) Discrete Structures 1

COMP 273 (3) Introduction to Computer Systems

COMP 302 (3) Programming Languages and Paradigm

COMP 303 (3) Software Development

COMP 304 (3) Object Oriented Software Design

COMP 310 (3) Operating Systems

COMP 330 (3) Theoretical Aspects: Computer Science

COMP 335 (3) Software Engineering Methods

COMP 350 (3) Numerical Computing

COMP 360 (3) Algorithm Design Techniques

All COMP courses at the 400-level (except 401,499, and 462) and all courses at the 500-level (except 561).

Biology Block

BIOL 300 (3) Molecular Biology of the Gene

BIOL 309 (3) Mathematical Models in Biology

BIOL 310 (3) Large Scale Ecology

BIOL 313 (3) Eukaryotic Cell Biology

BIOL 435 (3) Natural Selection

BIOL 518 (3) Advanced Topics in Cell Biology

BIOL 568 (3) Topics on the Human Genome

BIOL 569 (3) Developmental Evolution

BIOL 572 (3) Molecular Evolution

BIOL 583 (3) Advanced Biometry

10.0 Approvals

Routing Sequence	Name	Signature	Date
Department	<input type="text"/>	<input type="text"/>	<input type="text"/>
Curric/Acad Committee	<input type="text"/>	<input type="text"/>	<input type="text"/>
Faculty 1	<input type="text"/>	<input type="text"/>	<input type="text"/>
Faculty 2	<input type="text"/>	<input type="text"/>	<input type="text"/>
Faculty 3	<input type="text"/>	<input type="text"/>	<input type="text"/>
SCTP	<input type="text"/>	<input type="text"/>	<input type="text"/>
GS	<input type="text"/>	<input type="text"/>	<input type="text"/>
APPC	<input type="text"/>	<input type="text"/>	<input type="text"/>
Senate	<input type="text"/>	<input type="text"/>	<input type="text"/>

Submitted by

Name

Phone

Email

Submission Date

To be completed by ARR:

CIP Code