

COMBINED MAJOR IN SCIENCE SPECIALIZATION PROPOSAL

BACKGROUND

An allotment from the Strategic Priorities Fund (SPF) was awarded to the Faculty of Science to support student learning in the General Science Program (GSP).

Three goals were identified in the SPF (Strategic Priorities Fund) Initiative:

1. To establish an identity for students in the General Science Program.
2. To develop clearly defined GSP learning objectives.
3. To develop new courses and program structure to support General Science undergraduate education.

A Director (Shona Ellis, Botany) was assigned for the General Science Program and a committee formed to evaluate and restructure the GSP. The committee included members from almost all departments as well as Associate Deans within the Faculty of Science: Susan Allen (Earth and Oceans Science), Carl Michal (Physics), Jeff Young (Physics), Mark Thachuk (Chemistry), Shona Ellis (Biology), Christoph Hauert (Mathematics), Bruce Dunham (Statistics), George Tsiknis (Computer Science), Paul Harrison (Dean of Science Office), and Ian Cavers (Dean of Science Office).

Our primary objective was to develop a program that is unique, appealing, and academically robust. The program would provide students with the foundations within a number of areas in science while providing enough flexibility to enable them to take a greater number of both discipline-specific and interdisciplinary courses. The committee assessed current program structure and student course selections and developed program learning aims. The GSP has grown into a large, unstructured program in which students are often limited in the courses they can take because of prerequisite requirements and course availability. The courses they take are often a random assortment lacking cohesion and students do not feel like they belong to a learning community. It became apparent that program-specific courses are required to provide diversity and fulfill program learning aims, as well as to generate program identity. What emerged is a program very different in its focus and structure from the current GSP; a new specialization, Combined Major in Science, has been developed to better meet the needs of our students seeking a broad background in the sciences.

The Combined Major in Science (CMS) will gradually replace the General Science Program (GSP) as it is phased out over the next few years as current students in GSP graduate. The new program will meet the needs of students looking for a degree that provides them with a broad-based foundation in science and new CMS-specific courses will help develop program identity. The CMS provides a structured curriculum that develops breadth by offering foundations in three discipline areas of science as well as an introduction in a fourth (generalist requirement). Lab and field experiences through newly developed lab courses will promote experiential learning, and provide students the opportunity to understand how research is done and apply the scientific method. A statistics requirement will familiarize them with basic statistics and statistical modeling. A computing requirement will provide students with a basic ability in computation and data manipulation as well as develop problem-solving skills using computers. SCIE 300 (Communicating Science) will help students develop skills in critical evaluation and communication of scientific issues.

The structure of the new specialization will ensure that students can follow the program requirements in a timely fashion. It will target students not likely to pursue research careers,

rather, its goal is to equip students with the background to understand and evaluate scientific issues from a number of scientific disciplines. It will be particularly appealing for students preparing for professional schools such as education, law, medicine.

PHILOSOPHY AND LEARNING OBJECTIVES FOR CMS

The Combine Major in Science is intended to provide students with a broad-based science education. Traditional Majors and Honours programs are available for students wishing to focus in a single discipline. Combined programs and the Integrated Sciences program are available for students wishing to integrate two disciplines or design the focus of their program. The new Combined Major in Science is targeting students not likely to pursue research careers, rather, its goal is to equip students with the background to understand and evaluate scientific issues and statements from a number of scientific disciplines.

To accomplish the goals we have identified a list of learning aims for the CMS. With these in mind we have developed a structured program that requires significant discipline breadth, but at the same time provides students with increased flexibility, as they will be eligible to take a greater number of courses.

Learning Aims:

Conceptual Skills

Distinguish between data, observation, experiment, theory, and model.

Appreciate the limits of science.

Be able to critically evaluate scientific issues.

Research Skills

Design, execute, interpret, and express results of experiments.

Formulate and ask multiple relevant and testable research questions and construct a proposal to answer such questions.

Develop quantitative reasoning abilities.

Appreciate the role of statistics in the design and analysis of experiments and observational studies in the sciences.

Understand the basic notions of computation and algorithms and appreciate their use in modeling and investigating scientific problems.

Communication Skills

Communicate effectively on scientific topics: written, graphically, and verbally.

Present scientific issues to fellow students as well as non-scientists.

Collaborative Skills

Effectively work in groups (in all roles within the group).

Evaluate the work of other individuals.

Content Knowledge

Demonstrate an understanding of fundamental concepts, principles, and theories in multiple scientific disciplines.

Have background needed to pursue career goals (e.g., education).

CURRICULUM DEVELOPMENT

To meet the philosophy and learning aims of the program, students will be required to concentrate their studies in three areas of science (3 Packages).

In addition, there are a number of core requirements all CMS students must take:

- A statistics requirement will familiarize students with basic statistics and statistical modeling.
- A computing requirement will provide students with a basic ability in computation and data manipulation as well as develop problem-solving skills using computers.
- A lab requirement will promote experiential learning, giving students the opportunity to understand how research is done and the scientific method.
- A scientific communications course will enable students to critically evaluate and communicate current issues in science.
- A Generalist Requirement will ensure that every CMS student is exposed to current areas of science in a broad range of disciplines. While the package requirements ensure a high level of breadth, the package requirement on its own may leave gaps. Introductory courses in a number of disciplines (e.g. MATH 100/101 and PHYS 101/102) do not expose students to current applications of those areas of science (as that is not the goal of the courses). The courses selected for the generalist requirement aim, where possible, to fill these gaps by exposing students to modern aspects of disciplines that would otherwise be missed.

Program Structure:

A. First- and Second-Year Requirements:

Students must take a range of courses that support the disciplines within science, prepare them for the upper-level courses in the three packages they will chose, and fulfill the B.Sc. Lower-level Requirements:

- MATH 100 and 101 (or equivalents);
- Two CHEM and/or PHYS lecture courses at the 100-level beyond CHEM 111 and PHYS 100;
- At least 3 credits of ENGL 1** (ENGL 112 recommended) (the other 3 credits of the Communication Requirement will be fulfilled with a required course in third year of the CMS);
- two one-term laboratory courses chosen from ASTR, BIOL, CHEM, EOSC, GEOB, or PHYS;
- Students who do not have credit for high school Biology 11 or 12 must take three credits of 100-level BIOL. Other students must take one first-year lecture course chosen from ASTR, BIOL, EOSC, or GEOB.

Science One fulfills first-year science prerequisites for most CMS packages except for the Mathematical Sciences packages. Some Mathematical Sciences packages require CPSC 110 (or 111) and CPSC 121 as additional requirements; those courses can be taken as electives.

B. Core Requirements

1. Communicating Science – SCIE 300

Course Goals: to develop communication and presentation skills using scientific topics.

The course will be practical as students apply scientific knowledge. They will have the opportunity to integrate the disciplines in their program, evaluate/critique scientific

literature and media, present scientific information (orally, posters, reports, science blogs, etc.) for a general audience. Feedback will be from the class (peer evaluation) and the instructor.

Resources: 2 instructor positions*, 2 TAs (one TA per term)

Course Structure: 8 sections of 25 students, 3 hours of instructor contact per week

Communication Requirement: This course will count as three credits toward the B.Sc. Communication Requirement, which would mean that it would replace 3 credits of ENGL 1**. Therefore students would only have to take 3 credits of ENGL and will have greater choice of courses to fulfill the 18-credit Arts requirement for the B.Sc.. The promotion requirements will have to be adjusted. (Students are currently required to complete 6 credits of ENGL to be promoted to third year.)

* Current Instructors: Andrew Trites (Zoology), Bruce Dunham (Statistics), Jennifer Love (Chemistry), and Robin Stoodley (Chemistry).

As the course develops, the curriculum workgroup will consult with website developers, undergraduates, and selected members from other units (English, Journalism, Engineering, Law, etc.).

2. STAT 200 – can be replaced with STAT 241 or BIOL 300 in program

Note: There will be **no double counting** for the STAT requirement, i.e. BIOL 300 will not count as a life science elective.

3. Computing Requirement:

one of: CPSC 110 (or 111), CPSC 301, CPSC 210 (or 211), MATH 210, PHYS 210

4. 2 Lab courses chosen from:

New Chemistry Lab Course (designed for CMS) – CHEM 315

New Earth and Ocean Sciences Lab Course (designed for CMS) – EOSC 442

New Life Science Lab Course (in collaboration with Biology for CMS)

– BIOL 342

Physics Lab – PHYS 309

Note: The labs can be counted as part of the 9 credits in appropriate packages (see Section C below)

5. Generalist Requirement:

One course (at least 3 cr) from a discipline not represented in packages from:

Chemistry: CHEM 200-level

Earth Science: EOSC 340, 326, 477, 453, 354, 329, GEOB 400

Life Science: BIOL 121, 343, 345, 346, 438

Math: MATH 200-level, MATH 3** (new course developed by Mathematics; see information in Math Package)

Physics and Astronomy: PHYS 305, 313, 330

Prerequisites may be required.

Course recommendations will be provided to students taking different package combinations.

C. Combined Major in Science Packages

Packages for each of five areas of concentration (Chemistry, Life Science, Earth and Environmental Science, Mathematical Science, and Physics/Astronomy) consist of a minimum of 9 upper-level credits. Each package was developed in consultation with the appropriate department to provide students with a range of experiences.

1. Chemistry CMS Package

Rationale:

Due to curriculum changes involving second-year organic chemistry that occurred several years ago, only students in Chemistry and Biochemistry Majors and Honours streams can access CHEM courses at the 300- and 400-levels. Further, the offerings of upper-level CHEM courses are sub-discipline specific, and thus it is difficult to provide general chemistry content with a small number of courses

This proposal addresses these issues by offering two third-year lecture courses (shadow courses indicated below) that will also increase the options for additional fourth-year courses, and by creating a new course and lab specifically geared towards a more general audience.

Curriculum Development:

CHEM 315 - New Lab Course (1 credit, 1 term) – will cover a broad range of chemical experience in the lab, including the synthesis, characterization, and analysis of different chemical materials.

CHEM 341 – New Lecture Course – will cover a broad range of chemical principles using materials chemistry as a focus.

CHEM 343 – Lecture component of CHEM 313 without lab component (shadow course)

CHEM 345 – Lecture component of CHEM 305 without lab component (shadow course)

Chemistry CMS Package:

Prerequisites:

CHEM 121, 123 (or 111, 113)

CHEM 233, 235, 205

CHEM 341 (new course)

6 credits chosen from 300 and 400 level CHEM

2. Earth and Environmental Science CMS Package

Rationale:

Students are introduced to the breadth of physical science applied to understanding earth processes. All students will take a required Climate Science course and then choose from courses in the Fossil Record, Oceanography, Planets, Geomorphology, Hydrology, etc.

Curriculum Development:

EOSC 340 – new lecture course

EOSC 442 – new lab course (1 credit, 1 term) Climate Measurement and Quantification

Prerequisites: EOSC 340 and one of EOSC 211, PHYS 210, or CPSC 301

This lab course will be a combination of an observing program and computer-based labs that retrieve and analyze climate data.

Earth and Environmental Science CMS Package:

Prerequisites:

one of CHEM 111, CHEM 121

one of PHYS 101, PHYS 107

one of (a) ATSC 201, BIOL 111, BIOL 112, BIOL 121, GEOB 103, GEOB 200

or (b) EOSC 110 and EOSC 111

EOSC 340 (3 credits)

3 credits from EOSC 326*, EOSC 355, EOSC 372

3 credits from Earth and Environmental Science courses: ATSC, ENVR**, GEOB (except for GEOB 307, 407), EOSC (except for EOSC 310, 311, 312, 314, 315, 371, 470, 471, 474, 475, 478)

Recommended: another one of EOSC 326*, EOSC 355, EOSC 372 or EOSC 324*, EOSC 329*, EOSC 330*, EOSC 373 or GEOB 300*

* pre-requisites required

Environmental Sciences (ENVR) is developing two new courses. Each of these courses will have 50 seats for students in CMS.

3. Life Science CMS Package

Rationale:

A non-specific nine-credit requirement of upper-level life science courses provides students with the opportunity to concentrate in one area of life science (e.g., human biology) or the flexibility to sample from the different sub-disciplines. In the current proposal, the overall resources required by the CMS for life science students will be reduced over the current demand from General Science students, as students will take fewer life science courses and more from other discipline areas. Resources have been provided for the development of a new lab course (BIOL 342), which will introduce students to a variety of experimental techniques, organisms and biological problems across a range of biological sub-disciplines and provide an opportunity for experiential learning through the manipulation of these experimental systems, the collection and interpretation of experimental data and the presentation of these findings and their analysis in formal laboratory reports.

Curriculum Development:

BIOL 342 – new lab course (2 credits, 1 term) Integrative Biology Laboratory

- New lab developed for students in Biology and the Combined Major in Science

Life Science CMS Package:

Prerequisites:

BIOL 112, 121, (101, 102), BIOL 140, BIOL 200, (BIOL 201 Recommended)

9 credits of Life Science courses 300- or 400-level: ANAT 390, 391, BIOC, BIOL (except BIOL 300), GEOB 307, 407, MRNE, MEDG, MICB, PCTH, PHYL, PSYC 360-368, PSYC 460-462, and EOSC 470, 471, 474, 475, 478

4. Mathematical Science (MASC) Packages

Rationale:

The packages presented here are either focused in one of Mathematics, Computer Science and Statistics, or address the interfaces between disciplines. Due to the nature of these disciplines the pre-requisite requirements for courses in these fields are typically more demanding than in other areas in Science. It has been traditionally less than usual for General Science students to opt for courses in the mathematical sciences in their early years of study, and so such students could not be expected necessarily to have by their second year a set of courses that prepares them well for upper-level study in the mathematical sciences. In addition, it cannot be assumed that students will have had significant exposure to either Computer Science or Statistics in their secondary school education. Hence it is likely that CMS students specializing in the mathematical sciences will need substantial guidance in navigating a path to coherent study in these subjects.

Each of the packages presented aims to offer a suite of courses that would be most suitable to a General Science student looking to obtain a well-rounded exposure to one or more of the mathematical sciences. The goal is to focus on key courses, avoiding topics that may be deemed on the periphery of the mainstream areas in the fields. Students would of course be at liberty to select electives outside the courses recommended in these packages, subject to satisfying pre-requisite requirements.

There is one package for each of Computer Science, Mathematics and Statistics, and four additional options labeled A, B, C and D (Interface Packages). Option A combines all three of the disciplines, while the other three options nominate courses that promote the synergies between two of the disciplines.

Curriculum Development:

The Mathematics department will develop a new 300-level course demonstrating applications of mathematics across science. The course will be driven by examples and applications of mathematics in the other four core disciplines (Chemistry, Physics, Earth and Environment, and Biology). The goal is to provide students with an overview of the role of mathematics in deepening our understanding of natural phenomena through models and analysis. The detailed topics covered will be identified in close collaboration with the other core disciplines with an emphasis on biology. Based on the goals and the targeted audience of this course, it may be amenable to being taught by a team of faculty within applied mathematics or across disciplines. As prerequisites, this course should only require first-year MATH, which would make it also an ideal candidate for all CMS students to satisfy their Generalist Requirement.

Mathematical Science CMS Packages:

Student will select **one** of seven MASC packages:

Computer Science, Math, Statistics, and the four Interface Packages

Computer Science Option

Prerequisites: CPSC 110 (or 111), 121, 210 (or 211) (CPSC 213 recommended)

Required Courses

CPSC 221

6 credits 300- or 400-level CPSC

Recommended: CPSC 302*, 303*, 304, 312, 314, 320, 322, 340, 402, 406, 420, 421, 422, 430, 445

*additional prerequisites

Students choosing this package may need additional upper-level Science credits to meet the requirement for a minimum of 30 upper-level science credits.

Mathematics Option

Prerequisites: MATH 200, 221, (MATH 215 Recommended)

Required Courses:

9 credits 300- and 400-level MATH

Highly Recommended: MATH 302, 307, 317, 340.

Recommended*: MATH 303, 316, 345, 361, 441, 442, 445

* additional prerequisites

Statistics Option

Prerequisites: One of MATH 152, MATH 221, MATH 223 and one of STAT 200, STAT 241, STAT 251, BIOL 300.

Required Courses

Stat 306

6 credits from STAT 307, 308, 335, 344*, 442

*prerequisite: STAT 302

Interface Package Options:

Interface A Option

Prerequisites: CPSC 110 (or 111), MATH 200, 221

Required Courses:

Two of: MATH/STAT 302, MATH 303, STAT 305

One of CPSC 302, CPSC 303

Interface B Option

Prerequisites: MATH 200, 221

Required Courses:

MATH/STAT 302, MATH 303, STAT 305

Interface C Option

Prerequisites: CPSC 110 (or 111), MATH 200, 221

Required Courses:

CPSC 340, STAT 300, STAT 406

Interface D Option

Prerequisites: CPSC 110 (or 111), MATH 200, 221

Required Courses:

CPSC 302, CPSC 402, MATH 307

5. Physics and Astronomy CMS Package

Rationale:

The package will introduce students to the quantitative manner in which physicists seek to understand and describe physical phenomena. The upper-level credits in the package require students to take at least one course in a 'core' area of physics (electricity and magnetism, quantum mechanics, or thermodynamics). The remaining six upper-level credits allow the student flexibility to sample other physics or astronomy courses that meet their interests.

Curriculum Development:

PHYS 313 - Thermodynamics, has long been addressed to two groups of students, Physics majors and students in Earth and Ocean Sciences programs. In the past year, changes to the Physics major mean that those students will now be taking Phys 203 rather than 313, and plans are being developed to transform PHYS 313 to be more relevant to a broader audience by focusing on globally important issues such as energy production and climate change.

Physics/Astronomy CMS Package:

Student will select one of two packages:

1. Physics Option

Prerequisites: MATH 200, PHYS 101 (or 107) and PHYS 102 (or 108), (PHYS 200, 209, MATH 215 recommended)

Required Courses:

3 credits of PHYS 301, 304, 313

6 credits PHYS or ASTR courses 300- or 400-level

Recommended Courses: PHYS 301, 304, 305, 309, 312, 313, 314, 315, 318, 319, 404, 405, 420

2. Astronomy Option

Prerequisites: MATH 200, PHYS 101 (or 107) and PHYS 102 (or 108), PHYS 200, and one of PHYS 206 or 216. MATH 215 recommended

Required Courses:

PHYS 301

6 credits ASTR 303, 402

APPENDIX I – Summary Tables of courses for each package.

Additional CMS requirements are given at the bottom of each table.

	Chemistry	Earth and Environmental Sciences	Life Sciences	Physics and Astronomy
1st /2nd year prerequisite requirement for each discipline package	CHEM 121, 123 (or 111, 113) CHEM 233, 235, 205 (or 201, 203, 204)	CHEM 111 or 121 one of PHYS 101, 107 ^{**} one of ATSC 201, BIOL 111, 112, 121, GEOB 103, 200 or EOSC 110 and 111	CHEM 121, 123 (or 111, 113) BIOL 112, 121, 140 BIOL 200	PHYS 101, 102 (or 107, 108, 109) MATH 200
Recommended courses that increase the number of UL course choices			(BIOL 201 Recom.)	(PHYS 200, 209 Recom.) (MATH 215 Recom.)
3rd /4th Year Package Required and Elective Courses Must have a minimum of 9 credits of courses numbered 300 or higher in each package.	CHEM 341 (3) 6 credits CHEM courses 300- or 400-level	EOSC 340 (3) 3 credits from EOSC 326 ^{**} , 355, 372 3 credits from Earth and Environmental Science courses 300- or 400-level: ATSC, ENVR, GEOB (except for GEOB 307, 407), EOSC (except for EOSC 310, 311, 312, 314, 315, 371, 470, 471, 474, 475, 478) Recommended: another one of EOSC 326 ^{**} , 355, 372 or EOSC 324 ^{**} , 329, 330 ^{**} , 373 or GEOB 300 ^{**} Specific prerequisites required from the list ^{**}	9 credits Life Science courses 300- or 400-level Life Science courses include: ANAT 390, 391, BIOC, BIOL (except BIOL 300), GEOB 307, 407, MRNE, MEDG, MICB, PHAR, PHYL, PSYC 360-368, PSYC 460-462, and EOSC 470, 471, 474, 475, 478	Students will select one of two options: 1. Physics Option 3 credits of PHYS 301*, 304*, 313 6 credits PHYS or ASTR courses 300- or 400-level Recommended Courses: PHYS 301, 304, 305, 309, 312, 313, 314, 315, 318, 319, 404, 405, 420 *Prerequisites in addition to 1 st /2 nd Core 2. Astronomy Option 3 credits of PHYS 301 6 credits ASTR 303, 402
Lab Courses: Must take 2 out of the 4 options. Labs can count as part of 9 credit minimum in appropriate package.	CHEM 315 (1 cr) - Prerequisites: CHEM 233, 235, 205 EOSC 442 (1 cr) - Prerequisites: EOSC 340 and one of (EOSC 211, PHYS 210, CPSC 301) BIOL 342 (2 cr) - Prerequisite: BIOL 200 PHYS 309 (3 cr) - Prerequisite: PHYS 209			
Core Courses:	MATH 100/101 (or equivalent) STAT 200 (3), Communicating Science (SCIE 300) (3) Computing: one of: CPSC 110 (or 111), CPSC 301, EOSC 211, MATH 210, PHYS 210 (3)			

	Generalist Requirement (3)
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***Note: STAT 200 requirement can be replaced with STAT 241 or BIOL 300

PACKAGE SUMMARY CONTINUED

Mathematical Science Packages:

Students will select one option from the following two tables.

	Computer Science Option	Mathematics Option	Statistic Options
1st /2nd year prerequisite requirement for each package	CPSC 110 (or 111) CPSC 121 CPSC 210 (or 211)	MATH 200 (or 226) MATH 221 (or 223)	one of MATH 152, MATH 221, MATH 223 and one of STAT 200, STAT 241, STAT 251, BIOL 300 (also part of program)
Recommended courses that increase the number of UL course choices	(CPSC 213 Recom.)	(MATH 215 Recom.)	
3rd Year Program Required and Elective Courses Must have a minimum of 9 credits of courses numbered 300 or higher in each package	CPSC 221 6 credits CPSC 300- or 400-level Recommended: CPSC 302*, 303*, 304, 312, 314, 320, 322, 340, 402, 406, 420, 421, 422, 430, 445 Students choosing this package may need additional upper-level science credits to meet the requirement for a minimum of 30 upper-level science credits. *Prerequisites in addition to 1 st /2 nd Core	9 credits MATH 300- or 400-level Highly Recommended: MATH 302, 307, 317, 340. Recommended*: MATH 303, 316, 345, 361, 441, 442, 445 *Prerequisites in addition to 1 st /2 nd Core	STAT 306 6 credits from: STAT 307, 308, 335, 344**, 442 **Pre-requisite: STAT 302
Lab Courses: Must take 2 out of the 4 options. Labs can count as part of 9 credit minimum in appropriate package.	CHEM 315 (1 cr) - Prerequisites: CHEM 233, 235, 205 EOSC 442 (1 cr) - Prerequisites: EOSC 340 and one of (EOSC 211, PHYS 210, CPSC 301) BIOL 342 (2 cr) - Prerequisite: BIOL 200 PHYS 309 (3 cr) - Prerequisite: PHYS 209		
Core Courses:	MATH 100/101 (or equivalent) STAT 200 (3), Communicating Science (SCIE 300) (3) Computing: one of: CPSC 110 (or 111), CPSC 301, EOSC 211, MATH 210, PHYS 210 (3) Generalist Requirement (3)		

MATHEMATICAL SCIENCES (CONT):

Interface Options - options developed to promote synergies between the mathematical sciences.

	Interface Option A	Interface Option B	Interface Option C	Interface Option D
1st /2nd year prerequisite requirement for each package	CPSC 110 (or 111) MATH 200 MATH 221	MATH 200 (or 226) MATH 221	CPSC 110 (or 111) MAH 200 MATH 221	CPSC 110 (or 111) MATH 200 MATH 221
3rd Year Program Required and Elective Courses Must have a minimum of 9 credits of courses numbered 300 or higher in each package.	Two of: MATH/STAT 302 MATH 303 STAT 305 One of: CPSC 302, 303	MATH/STAT 302 MATH 303 STAT 305	CPSC 340 STAT 300 or 306, 406	CPSC 302, 402 MATH 307
Lab Courses: Must take 2 out of the 4 options. Labs can count as part of 9 credit minimum in appropriate package.	CHEM 315 (1 cr) - Prerequisites: CHEM 233, 235, 205 EOSC 442 (1 cr) - Prerequisites: EOSC 340 and one of (EOSC 211, PHYS 210, CPSC 301) BIOL 342 (2 cr) - Prerequisite: BIOL 200 PHYS 309 (3 cr) - Prerequisite: PHYS 209			
Core Courses:	MATH 100/101 (or equivalent) STAT 200 (3), Communicating Science (SCIE 300) (3) Computing: one of: CPSC 110 (or 111), CPSC 301, EOSC 211, MATH 210, PHYS 210 (3) Generalist Requirement (3)			

APPENDIX II – SURVEY: GENERAL SCIENCE STUDENTS 2008

– Total number of respondents = 99

This Survey was released at the Information Session (September 2008) and then sent by email to all third and fourth year students. This is the abbreviated version of the results; complete survey will be provided upon request.

Primary Area of Concentration:

Earth – 1 and 1 possible

Chemistry - 5

Life Science – 81 and 2 possible

Mathematics - 1

Physics and Astronomy – 1 possible

Undecided – 8 (those who stated undecided as well as those who did not fill in that part)

Secondary Area(s) of Concentration:

Earth – 25 (Route A) and 10 (+1 possible) (Route B)

Chemistry – 15 (Route A), 16 (Route B)

Life Science – 6 (Route A) and 1 possible (Route A) +1 (but selected life as primary as well)

Mathematics – 5 (route A), 5 (Route B)*

Physics and Astronomy - 2 (Route B)

Undecided – 24

Gender:

Female ---- 65

Male -- 31

Year Level:

1st---- 1

2nd – 17 (from the information night)

3rd -- 41

4th -- 37

5th ----1

Not specified – 2

Total = 99

Why students are in Combined Major in Science.

Most because they like the flexibility

Could not get into program of choice (42).

What were their programs of choice?

(2nd year)

- Psychology
- Biology - 3
- Pharmacology – 2
- Environmental science
- Commerce

(3rd year)

- Chemistry
- Pharmacy - 2
- Biotech honours

- Biology – 5
- Microbiology and Immunology - 4
- Biochem 3
- General Biology & Computer Science Comb.

(4th year)

- Biochem 3
- Biology – 8
- Chemistry
- Microbiology 4
- Physiology
- nutritional science

Why students not get into their program of choice:

- most said that courses were full or restricted

For this school year, did student get into the courses he/she wanted to?

Yes:

1st --- 1/1
 2nd ---16/17
 3rd --- 24/39
 4th --- 24/31
 5th---1/1
unknown---1/1
total: 67/90

Academic/career goals. (They could choose more than one.)

- Graduate School – 35 (includes some with expressed interest in rehab medicine)
- Education Program - 23
- Medicine - 44
- Dentistry - 7
- Optometry - 3
- Law - 5
- Other:
 - BCIT/ working.
 - Possibly attain a degree in biology.
 - Nursing - 4
 - Accounting - 2
 - Perhaps research
 - Take some time off and learn a trade skill that I can travel around with.
 - Finish my undergrad then perhaps apply for pharmacy but first take a year off.
 - Graphic design or architecture
 - Undecided
 - Naturopathic medicine
 - Public Health Policy
 - Dietetics
 - Laboratory experimental research
 - Pharmacy
 - Food/Nutrition/Health, Culinary arts, Health Care

Courses or topics students would like to be offered.

- Current global situation (with regards to petroleum, global warming).
- Pre-med related courses (lots).
- Geography? (as a separate category)
- More choices in the specializations, ie EOSC and biology.
- More ATSC courses (only one in 2nd year)
- More earth and ocean science courses
- Courses integrated with socio-related subjects ex. HIV is not a sciencefic diseases but more -
Biotechnology
- Chemistry with no intense lab hours.
- Chemistry courses without lab. (lots of interest in new chemistry courses)
- Neurology
- Many students seem to be wanting courses that will prepare them for grad schools such as med school, dentistry, law, etc.
- I would like to see simplified biology courses offered for students who hadn't taken biology in high school, and these courses should cover the same material, just in smaller detail.
- courses mixing different sciences and linking them together.
- Less lab courses
- I would like to see courses that are geared towards environmental sustainability and ecology as well as more anatomy type courses.
- More courses in all the subject areas that have few prereqs as it can be hard to find enough credits in the many broad subjects people study in general science.
- combine biology and chemistry together(e.g. biochemistry), physiology, microbiology, food and nutritional sciences.
- Courses about environmental health – EOSC. More applicable courses relating to city issues eg. water management etc.
- Course that offers an integration between science and business
- Intro ecology, intro astronomy (upper level) for science students, more anthropology classes in
- I wish there were more courses that offer general science students laboratory experience that would benefit them in graduate school and research, perhaps the usage of a variety of experimental tools besides the microscope.
- some conservation sciences (lots of requests for environment, climate change)
- I believe there are already more than enough courses that are offered for life science students.
- More basic and fundamental Mathematics courses.
- More focus on integrating different areas of science
- Public Speaking courses\