153rd Meeting of the Faculty Council of Science
February 5, at 2:00pm
Virtual (Zoom)

1.0 Dr. M. Benarroch, President and,
Dr. J. Ristock, Provost and Vice-President (Academic)

2.0 Approval of Agenda

3.0 Approval of Minutes - 152nd meeting, December 22, 2020
(material attached)

4.0 185th Faculty Executive Council
a. Undergraduate Course and Program Changes – B. Li

5.0 Dean’s Report

6.0 Other Business

7.0 Adjournment

**Please send regrets to: Tracy.Foster@umanitoba.ca

Dates for next Faculty Council Meeting: TBD

Faculty Council, Faculty of Science Zoom Meeting
https://zoom.us/j/92781207222?pwd=S1UxQW9NQ1NmY0dYU3pucGNxUHJlWz09
Meeting ID: 927 8120 7222
Passcode: 782589
One tap mobile
+12532158782,,92781207222#,,*782589# US (Tacoma)
+13017158592,,92781207222#,,*782589# US (Washington D.C)

Dial by your location
+1 253 215 8782 US (Tacoma)
+1 301 715 8592 US (Washington D.C)
+1 312 626 6799 US (Chicago)
+1 346 248 7799 US (Houston)
+1 669 900 6833 US (San Jose)
+1 929 205 6099 US (New York)

Find your local number: https://zoom.us/u/avTNQBL5s
152nd Meeting of the Science Faculty Council  
Tuesday, December 22, 2020, at 10:00 a.m.  
Virtual

MINUTES

PRESENT:

Chair: S. Baum, Dean
Recording: T. Foster

ATTENDEES:

A. Kumar  K. Yee
A. Leblanc  L. Leboe-McGowan
B. Li  L. Wang
B. Mark  M. Domaratzki
B. Van Nest  M. Turgeon
C. Kuss  P. Loewen
C. Latulipe  R. Borgersen
D. Court  R. Cameron
D. Gillis  R. Stamps
D. Pahud  R. Thomas
E. Huebner  S. Harris
E. Vasas  S. Lui
G. Prehna  S. McKenna
J. Doering  S. Muthukumarana
J. Hare  T. Booth
J. O’Neil  T. Dekievit
K. Koczanski  T. Kucera
K. Scott  Z. Mateo
K. Shamseddine

REGRETS:  S. Kirkland  J. Sorensen
  G. Gwinner

1.0 Approval of Agenda

MOTION to approve the agenda.
MOVED:  J. O’Neil
SECONDED:  D. Court
The Motion CARRIED
2.0 Approval of Minutes

**MOTION** to approve the minutes of the 151st meeting of Faculty Council held September 4, 2020.

**Friendly amendment:** Members not recorded as attending at the September 4, 2020 council meeting, were in attendance. T. Kucera, S. Lui, R. Eskicioglu, K. Yee.

**MOVED:** T. Kucera  
**SECONDED:** A. Kumar  
The Motion CARRIED

3.0 Proposal to establish a Univest Professorship in Lab-on-Chip Technology

**MOTION** that Faculty Council for approval the establish a Univest Professorship in Lab-on-Chip Technology. Discussion followed. Unanimous vote in favour.

**MOVED:** B. Mark  
**SECONDED:** T. Booth  
The Motion CARRIED

4.0 Adjournment

Meeting adjourned at 10:14am
FACULTY OF SCIENCE COURSE AND PROGRAM CHANGES
Faculty Council Submission, February 2021

• Course and Program Changes approved at the January 21, 2021 meeting of the Faculty of Science Committee on Courses and Programs (COCAP).

• Course Deletions, Introductions, and Modifications approved at Faculty Executive on January 29, 2021, forwarded to Faculty Council for informational purposes.

• Program Proposals forwarded by Faculty Executive, and recommended to Faculty Council for approval.

Summary - Proposed Course and Program Changes

Faculty of Science

Course Introductions:

SCI 1002 Topics in Science 1 with Laboratories +3
SCI 2002 Topics in Science 2 with Laboratories +3
SCI 3002 Topics in Science 3 with Laboratories +3

Net Change in Credit Hours: +9

Program Modification:

B.Sc. General Degree

The Faculty of Science is proposing modifications to the B.Sc. General Program. The introductory course requirements are proposed to require 9 credit hours from Computer Science/Mathematics/Statistics, 6 credit hours from Chemistry/Physics & Astronomy, and 6 credit hours from Biological Sciences/Microbiology.

The advanced level requirements are proposed to require 36 hours of 2000 level or higher Faculty of Science courses, with at least 9 credit hours at the 3000 level or higher. We propose to no longer require these hours be split over two departments, or the Biological Sciences or Chemistry focus options.

Biochemistry

Program Modification:

B.Sc. Honours & Major in Biochemistry
The JMCCB is proposing to modify the B.Sc. Honours and Major Programs in response to the deletion and introduction of courses in the Microbiology department. Specifically, the deletion of MBIO 3030, 3280, 3470, the proposed deletion of MBIO 4670, and the introduction of MBIO 3032, 3282, 3472, and 3700.

**Department of Biological Sciences**

**Course Modifications:**

- BIOL 2300 Principles of Ecology 0
- BIOL 4216 Biology of Birds 0

**Net Change in Credit Hours:** 0

**Program Modification:**

**B.Sc. General**

The Department of Biological Sciences is proposing to make modifications to its calendar description to remove mention of the requirements for the 3-year general science degree, and the optional Biological Sciences focus in the 3-year general science degree. This change is to align with the changes that the Faculty of Science is making to its general degree program.

**Biotechnology**

**Program Modification:**

**B.Sc. Honours & Major in Biotechnology**

The departments of Chemistry and Microbiology are proposing modifications to the B.Sc. Honours and Major program in response to upcoming changes in course offerings in the two departments. Note: As of Fall 2018, admission to the Biotechnology programs has been temporarily suspended.

**Department of Chemistry**

**Course Introduction:**

- CHEM 1018 Chemistry – The Central Science +3

**Course Modifications:**

- CHEM 2730 Elements of Biochemistry 1 0
- CHEM 2740 Introduction to the Biochemistry Laboratory 0
- CHEM 2750 Elements of Biochemistry 2 0
Net Change in Credit Hours: +3

Program Modification:

B.Sc. General

The department of Chemistry is proposing to remove the "Three Year B.Sc. General - chemistry focus" and the Three Year B.Sc. general degree charts from the Chemistry section in the academic calendar.

Department of Computer Science

Program Modification:

B.Sc. General

The department of Computer Science is proposing to remove the General program charts and description listed in the departmental section of the general calendar, in response to changes to the B.Sc. General degree.

Department of Mathematics

Course Introduction:

MATH 1018 Pre-calculus in Practice +3

Net Change in Credit Hours: +3

Program Modification:

B.Sc. General

The department of Mathematics, in response to proposed changes by the Faculty of Science to eliminate focus areas for the BSc General degree, proposes to remove/delete the BSc General Mathematics Program Chart in the Academic Calendar (see Section 4.9.1 and 4.9.2.7 in Academic Calendar).

Department of Microbiology

Course Deletion:

MBIO 4670 Applied Molecular Biology H -3

Course Modifications:

MBIO 2730 Elements of Biochemistry 1 0
MBIO 2750 Elements of Biochemistry 2 0
MBIO 4672 Applied Molecular Biology

Net Change in Credit Hours: -3

Program Modification:

B.Sc. General

The Microbiology program is proposing modifications to the B.Sc. General program, Microbiology concentration, in response to changes proposed by the Faculty of Science. In accordance with the removal of department-specific concentrations from the program, references to the previous B.Sc. General program will be removed from the Microbiology portion of the calendar. In addition, MBIO 2730 and MBIO 2750 are now allowed to be part of minor program in Microbiology.

Department of Physics & Astronomy

Course Introduction:

PHYS 1018 The Mechanics of Nature +3

Net Change in Credit Hours: +3

Program Modification:

B.Sc. General

The Physics and Astronomy department is proposing to remove the three-year B.Sc. General program's chart from the Physics and Astronomy's section in the undergraduate calendar, in response to proposed changes by the Faculty of Science.

Department of Statistics

Program Modifications:

B.Sc. General Degree

The Department of Statistics is proposing to delete its Statistics Concentration from the three-year General Degree. The Faculty of Science is suggesting major changes to its three-year General Degree, which includes the deletion of all areas of concentration. The Department of Statistics supports all the suggested changes and, as a consequence, is making this proposal.
Science Topics courses with Laboratories (SCI1002, SCI2002, SCI3002)

Summary

The Faculty of Science would like to introduce topics courses at the undergraduate level. These courses will tentatively be titled Topics in Science with Laboratories 1,2,3 with proposed course numbers SCI 1002, SCI 2002, and SCI 3002 respectively.

The main purpose of these courses is to provide the Faculty of Science flexibility in offering interdisciplinary Science courses with laboratories. This will allow the Faculty of Science to offer interdisciplinary courses that do not fit within a single department. These courses will be available to all students (not just Science students) and may be used to satisfy a Science requirement.

The Faculty of Science intends to offer a wide variety of interdisciplinary courses, based on the interests of faculty and students. To do this, we are not placing any strict academic restrictions on these courses. Instead, restrictions will be placed based on actual offerings (that is, consent of the instructor(s)).

These courses complement the existing SCI 1000, 2000, 3000 and 4000 that do not contain a laboratory component.
UNDERGRADUATE COURSE INTRODUCTION
SCCC Fall 2020/Spring 2021

If the short course title, course number, subject code, or number of credit hours is to be changed, the current course MUST be deleted and re-introduced under the new title and/or course number and/or different credit hours.

Place the cursor over each form field for instructions. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes for additional instructions.

SECTION A – COURSE DETAILS
Faculty/College/School: Science
Department or Program: Choose one
Subject code: SCI Course number: 1002 Confirm with Registrar prior to submitting to SCCC.

Long Title (maximum 90 characters):
Topics in Science 1 with Laboratories

Short Title (maximum 30 characters): Topics in Science 1 with Lab
Credit Hours: 3 Grading mode: Letter Grade Spanned Course: □
First term offered: Fall 2021

SECTION B – COURSE DESCRIPTION FOR ACADEMIC CALENDAR
Provide the course description, exactly as it would appear in the Academic Calendar. See the Guidelines for information on completing this section of the form, including the examples provided there.

SCI 1002 Topics in Science 1 with Laboratories Cr. Hrs. 3
(Lab Required) Topics of current interest in the Faculty of Science. Offerings will be based on the interests and requirements of students and faculty, and will include specialized and/or interdisciplinary topics not available in regular course offerings. This course can be used to satisfy a Science elective. Non-science students should check with their department. This course is a Topics course and may be completed multiple times under different titles. Prerequisite: consent of the instructor.

SECTION C – RATIONALE FOR NEW COURSE (See the Guidelines for instructions on how to complete this section of the form.)
□ Responds to a recommendation in an external undergraduate program review.

Provide a brief rationale for the course introduction in the space provided.

The main purpose of these courses is to provide the Faculty of Science flexibility in offering interdisciplinary courses with labs. This will allow the Faculty of Science to offer interdisciplinary courses that do not fall within a single department. These courses can be used to satisfy a Science elective.
SECTION D – REGISTRATION RESTRICTIONS

Indicate where registration is restricted to students in a faculty/college/school or academic program(s), including level or year of study. List the faculty/college/school and/or programs(s). Indicate registration restrictions in the course description.

Faculty/college/school restrictions:

Program restrictions (e.g. Honours):

SECTION E – ADDITIONAL COURSE DETAILS

Laboratory / Tutorial / Field Trip Requirement: Indicate laboratory / tutorial / field trip requirement in course description.

☑ Laboratory required ☐ Field trip required ☑ Tutorial required

Topics Courses:

☑ This is a topics course.
☑ This course can be completed as a topics course multiple times under different titles. Note in course description in Section B of this form.

Written English and Mathematics Requirements, Recommended Introductory Course List for U1: Check all boxes that apply. Attach Request for Statement of Support Form(s) and responses received.

☐ Course satisfies Written English requirement.
☐ Course satisfies Mathematics requirement.
☐ Accepted for Recommended Introductory Course List (RIC List)

SECTION F – RESULTING CHANGES TO COURSES/PROGRAM(S)

See the Guidelines for instructions on how to complete this section of the form. Check all boxes that apply.

This course introduction leads to changes to:

☐ other courses in your unit. Submit a Course Modification proposal for those courses.
☐ programs in your unit. Submit Program Modification Forms.
☐ courses in other academic units. Requests for Statement of Support Forms are required.
☐ program changes in other academic units. Requests for Statement of Support Forms are required.

List all courses and/or programs that are affected, including those in other departments/faculties/colleges/schools. Be as specific as possible.
SECTION G – STATEMENT OF ADDITIONAL COSTS, WORKLOAD, AND/OR SUPPLIES
See the Guidelines for instructions on how to complete this section of the form. Indicate where not applicable.

n/a

SECTION H – PREREQUISITE, COREQUISITE, PRE- OR COREQUISITE, & EQUIVALENCY/MUTUAL EXCLUSIVITY
List all prerequisite, corequisite, pre- or corequisite, equivalent, and mutually exclusive courses, including all applicable previous courses numbers (both Aurora and IMS course numbers). See definitions in the Guidelines.

Indicate as a letter grade where a minimum grade for a prerequisite course, examination, or equivalency test is required. A minimum grade of “C” is assumed. A different minimum grade must be stated. Indicate where concurrency is allowed.

Prerequisites: (MUST be taken before)

consent of the instructor

Pre- or Corequisites (MUST be taken either before or at the same time)

Corequisites [MUST be taken at the same time and not be a spanned course]

Equivalent courses (May NOT be held with existing or former courses with equivalent content, same credit hours, same level. Can be used to meet same program requirements.)

Mutually exclusive courses (May NOT be held with existing or former courses with significant content overlap and/or different credit hours and/or different level or the same course previously offered as a topics course. Cannot be held together for credit or used to meet the same program requirement.)
SECTION I – SUPPORTING DOCUMENTATION ATTACHED

See the Guidelines for information on required supporting documentation.

☐ Course outline (required)
☐ Library statement (normally required)
☐ Request for Statement of Support Forms and responses received
☐ Program Modification Form(s) – included with faculty/college/school submission to SCCCC

SECTION J – SIGNATURES*

Department Approval: ____________________________ ____________________________

Faculty/College/School Approval:

Ben Pac Ching Li ____________________________ 1/14/2021

*Signatures are not required for Fall 2020 Submissions to SCCCC.
**Tentative Course title:** Topics in Science with Laboratories 1002 (SCI 1002): An Illustrated Introduction to the Interdisciplinary Science of Imaging.

**Level:** 1000

**Instructors:**

Stephen Pistorius – Professor, Dept. of Physics and Astronomy  
Stephen Kirkland – Professor & Head, Dept. of Mathematics  
Yang Wang – Assistant Professor, Department of Computer Science

**Pre-requisite:** Consent of the Instructor.

The course will be structured as a series of illustrated lectures by scientific experts in their field on topics related to Imaging Science. This course will be presented at an introductory level.

**Tentative Course outline**

1. The Mathematics of Imaging  
2. The Physics of Image Formation and Detection  
3. Mathematical Methods in Image reconstruction  
4. Computational Models of Vision  
5. Imaging for Quality Control in medicine and industry  
6. Image Processing and Analysis  
7. Medical Imaging (CT, MRI, PET)  
8. Astrophysics Imaging  
9. Remote Sensing  
10. Geographic Information Systems and images,  
11. 3D computer vision and virtual reality  
12. Image Interpretation (Image recognition, Motion Tracking)  
13. Imaging Game Science  
14. Parallel and Distributed computing.  
15. Introduction to Graphic Processing Units and CUDA  
16. Chemical Imaging  
17. Microwave Imaging  
18. Optical Imaging  
19. Novel Imaging Applications and Techniques  
20. The Art of imaging and Imaging in Art
Motivation: Imaging Science is playing an ever-important role in our lives with applications in Medicine, Industry, Entertainment, Security, Research, and in the Arts. The University of Manitoba has many discipline specific experts in imaging who teach high level courses on this material, but we are unaware of any interdisciplinary courses which introduce the student to the varied, fascinating and interdisciplinary field of Imaging Science. This course will complement the discipline specific courses by providing the student easy access to the various applications in which imaging plays a vital role. This will (hopefully) encourage students to enter one or more of these disciplines with the aim of a career in imaging science and to take those courses which will provide them with greater understanding and training in this field. This course will make extensive use of images to illustrate the theory, tools, and techniques behind the imaging applications and how imaging is used to resolve many questions and challenges that face society.

The students will learn about how images are created, the different imaging modalities and their terminology, the basic mathematical, physical and computational principles and the benefits and challenges facing each modality. They will learn the basic concepts of image reconstruction, visualization and how imaging systems are used in various applications.

Tutorials will be used to re-enforce important hands-on concepts and skills.

Formats:

Lectures will be given in-class, 3 hours a week, and there will be a weekly 50-minute tutorial.

Target Student Audience: 1st year students who have an interest in Mathematics, Computer Science and Physics & Astronomy as well as students from other fields who have an interest in imaging.

Evaluation:
Evaluation and feedback of each module/presenter - 10%
Quizzes following each module - 30%
Laboratories/Tutorials – 20 %
Final Exam – 40%

Final Grades:

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<td>55-59</td>
<td>D</td>
</tr>
<tr>
<td>0-54</td>
<td>F</td>
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</tbody>
</table>
University of Manitoba Libraries
Statement for Undergraduate Curriculum Change

Faculty
Department
Course #
Course Name

Science
SCI 1002
Topics in Science with Laboratories

The Libraries' collection can support this new course, as it was described in the documents provided.

It is not expected that this proposed change will affect the Libraries' ability to continue to provide services such as research and teaching support, reference assistance, document delivery, and the technical infrastructure which allows the discovery and delivery of the Libraries' resources and services.

Please advise the liaison librarian about any future changes to the special topics discussed in this course so that they have an opportunity to assess the collection's coverage of new topics.

Vickie Albrecht
Acting Head, Sciences Division

Kristen Kruse
Coordinator, Collections Management

Lisa Hanson O'Hara
Vice Provost (Libraries) & University Librarian

November 12, 2020
Date
SECTION A – COURSE DETAILS

Faculty/College/School: Science

Department or Program: Choose one

Subject code: SCI Course number: 2002

Long Title (maximum 90 characters):
Topics in Science 2 with Laboratories

Short Title (maximum 30 characters): Topics in Science 2 with Lab

Credit Hours: 3 Grading mode: Letter Grade

First term offered: Fall 2021

SECTION B – COURSE DESCRIPTION FOR ACADEMIC CALENDAR

Provide the course description, exactly as it would appear in the Academic Calendar. See the Guidelines for information on completing this section of the form, including the examples provided there.

SCI 2002 Topics in Science 2 with Laboratories Cr. Hrs. 3
(Lab Required) Topics of current interest in the Faculty of Science. Offerings will be based on the interests and requirements of students and faculty, and will include specialized and/or interdisciplinary topics not available in regular course offerings. This course can be used to satisfy a Science elective. Non-science students should check with their department. This course is a Topics course and may be completed multiple times under different titles. Prerequisite: consent of the instructor.

SECTION C – RATIONALE FOR NEW COURSE (See the Guidelines for instructions on how to complete this section of the form.)

Responds to a recommendation in an external undergraduate program review.

Provide a brief rationale for the course introduction in the space provided.

The main purpose of these courses is to provide the Faculty of Science flexibility in offering interdisciplinary courses with labs. This will allow the Faculty of Science to offer interdisciplinary courses that do not fall within a single department. These courses can be used to satisfy a Science elective.
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Indicate where registration is restricted to students in a faculty/college/school or academic program(s), including level or year of study. List the faculty/college/school and/or programs(s). Indicate registration restrictions in the course description.

Faculty/college/school restrictions:

Program restrictions (e.g. Honours):

SECTION E – ADDITIONAL COURSE DETAILS

Laboratory / Tutorial / Field Trip Requirement: Indicate laboratory / tutorial / field trip requirement in course description.

☑ Laboratory required ☐ Field trip required ☑ Tutorial required

Topics Courses:
☑ This is a topics course.
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☐ Course satisfies Mathematics requirement.
☐ Accepted for Recommended Introductory Course List (RIC List)

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☐ courses in other academic units. Requests for Statement of Support Forms are required.
☐ program changes in other academic units. Requests for Statement of Support Forms are required.

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n/a

SECTION H – PREREQUISITE, COREQUISITE, PRE- OR COREQUISITE, & EQUIVALENCY/MUTUAL EXCLUSIVITY
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Prerequisites: (MUST be taken before)

consent of the instructor

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Corequisites (MUST be taken at the same time and not be a spanned course)

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☑ Course outline (required)
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☑ Request for Statement of Support Forms and responses received
☐ Program Modification Form(s) — included with faculty/college/school submission to SCCCC

SECTION J – SIGNATURES*

Department Approval: ____________________________________________

Type Name Date

Faculty/College/School Approval:

Ben Pak Ching Li 1/14/2021

Type Name Date

*Signatures are not required for Fall 2020 Submissions to SCCCC.
SCI 2002 Assessing Global Change in the Anthropocene
Winter 2021
Instructors Dr. Jennifer Vaughan, Dr. Kevin Fraser
Email jennifer.vaughan@umanitoba.ca, kevin.frasen@umanitoba.ca

Course Description

From agriculture to industry to urbanization, human activity has had an immense impact on the ecosystems of the Earth. How can we measure the resulting changes in natural systems? In this course, we discuss global climate change and other environmental consequences of human activity in Canada and around the world. We also develop statistical techniques for analyzing the effect of these environmental factors on individuals, populations, communities, and ecosystems, and for using historical data to predict future trends.

Prerequisites

One of STAT 1000 or STAT 1150 is required. BIOL 1030 is strongly recommended.

Course Content

We will begin with a review of global environmental climate change in the Anthropocene, followed by a focus on Canada. We will also discuss, for example, how to measure the impacts of environmental change on individual behaviour, population dynamics, and biodiversity. Sources of biotic and abiotic data will be introduced at the beginning of the course.

The statistics content will be driven by the needs of the project. Topics may include multiple linear regression, data visualization, and hypothesis testing.

There will be a series of assignments in which students will practice using the statistical tools and techniques that they will need for the project. Statistical analyses will be implemented in R.

The course content will be covered in the first eight weeks of the term.

Textbook

There is no textbook for this course. Class notes and supplementary materials will be posted on UMLearn week by week.

Grade Breakdown

- Quizzes - 5%
- Laboratory - 15%
- Assignments - 15%
- Term Test - 30%
- Project - 35%

Quizzes

There will be a series of seminars on the use of different fields of Science in studying and responding to global climate change. Each seminar will be followed by an in-class quiz. These quizzes are worth a total of 5% of the final grade.
Laboratory

Laboratories will be held once a week, beginning in week 2. Attendance is mandatory. During lab, students will collect biological samples from the local environment and analyze them to detect the changes that are discussed in class. Each lab will have a corresponding series of exercises that must be completed and submitted. Laboratory exercises are worth a total of 15% of the final grade.

Assignments

There will be 4 assignments throughout the term, worth a total of 15% of the final grade.

Assignment 1 - posted in week 3, due in week 5  
Assignment 2 - posted in week 4, due in week 6  
Assignment 3 - posted in week 6, due in week 8  
Assignment 4 - posted in week 8, due in week 10

Term Test

The term test is worth 30% of the final grade. It will be held in class in week 9, covering all lecture content from weeks 1 - 8.

Project

Working in teams, students will use the statistical techniques learned in class to carry out the following tasks.  
(1) Formulate a hypothesis concerning one of the available datasets, then implement the appropriate statistical analysis to test that hypothesis. Submit a report outlining the procedure and conclusions.  
(2) Use existing climate data for a particular city or region to predict future changes from past ones, and discuss the expected impact of those changes.

Class time will be given for project work during weeks 9 - 12.

Grading

The following letter grades will be applied:  
A+ 90 - 100%  
A 80 - 89%  
B+ 75 - 79%  
B 70 - 74%  
C+ 65 - 69%  
C 60 - 64%  
D 50 - 59%  
F < 50%

Format:

The first 8 weeks of lectures will be in-class lectures and the last 4 weeks of lectures will be group-based discussions/collaborations. There will be a weekly 75-minute laboratory starting in week 2.
University of Manitoba Libraries
Statement for Undergraduate Curriculum Change

Faculty: Science
Department: Sci 2002
Course Name: Topics in Science with Laboratories

The Libraries' collection can support this new course, as it was described in the documents provided.

It is not expected that this proposed change will affect the Libraries' ability to continue to provide services such as research and teaching support, reference assistance, document delivery, and the technical infrastructure which allows the discovery and delivery of the Libraries' resources and services.

Please advise the liaison librarian about any future changes to the special topics discussed in this course so that they have an opportunity to assess the collection's coverage of new topics.

Vickie Albrecht
Acting Head, Sciences Division

Kristen Kruse
Coordinator, Collections Management

Lisa Hanson O'Hara
Vice Provost (Libraries) & University Librarian

November 12, 2020
Date
UNIVERSITY OF MANITOBA

UNDERGRADUATE COURSE INTRODUCTION

SCCCC Fall 2020/Spring 2021

If the short course title, course number, subject code, or number of credit hours is to be changed, the current course MUST be deleted and re-introduced under the new title and/or course number and/or different credit hours.

Place the cursor over each form field for instructions. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes for additional instructions.

SECTION A – COURSE DETAILS

Faculty/College/School: Science

Department or Program: Choose one

Subject code: SCI Course number: 3002 Confirm with Registrar prior to submitting to SCCCC.

Long Title (maximum 90 characters):
Topics in Science 3 with Laboratories

Short Title (maximum 30 characters): Topics in Science 3 with Lab

Credit Hours: 3 Grading mode: Letter Grade Spanned Course: □

First term offered: Fall 2021

SECTION B – COURSE DESCRIPTION FOR ACADEMIC CALENDAR

Provide the course description, exactly as it would appear in the Academic Calendar. See the Guidelines for information on completing this section of the form, including the examples provided there.

SCI 3002 Topics in Science 3 with Laboratories Cr. Hrs. 3

(Reg Required) Topics of current interest in the Faculty of Science. Offerings will be based on the interests and requirements of students and faculty, and will include specialized and/or interdisciplinary topics not available in regular course offerings. This course can be used to satisfy a Science elective. Non-science students should check with their department. This course is a Topics course and may be completed multiple times under different titles. Prerequisite: consent of the instructor.

SECTION C – RATIONALE FOR NEW COURSE (See the Guidelines for instructions on how to complete this section of the form.)

□ Responds to a recommendation in an external undergraduate program review.

Provide a brief rationale for the course introduction in the space provided.

The main purpose of these courses is to provide the Faculty of Science flexibility in offering interdisciplinary courses with labs. This will allow the Faculty of Science to offer interdisciplinary courses that do not fall within a single department. These courses can be used to satisfy a Science elective.
SECTION D – REGISTRATION RESTRICTIONS

Indicate where registration is restricted to students in a faculty/college/school or academic program(s), including level or year of study. List the faculty/college/school and/or programs(s). Indicate registration restrictions in the course description.

Faculty/college/school restrictions:

Program restrictions (e.g. Honours):

SECTION E – ADDITIONAL COURSE DETAILS

Laboratory / Tutorial / Field Trip Requirement: Indicate laboratory / tutorial / field trip requirement in course description.

✓ Laboratory required
□ Field trip required
✓ Tutorial required

Topics Courses:

✓ This is a topics course.
✓ This course can be completed as a topics course multiple times under different titles. Note in course description in Section B of this form.

Written English and Mathematics Requirements, Recommended Introductory Course List for U1: Check all boxes that apply. Attach Request for Statement of Support Form(s) and responses received.

□ Course satisfies Written English requirement.
□ Course satisfies Mathematics requirement.
□ Accepted for Recommended Introductory Course List (RIC List)

SECTION F – RESULTING CHANGES TO COURSES/PROGRAM(S)

See the Guidelines for instructions on how to complete this section of the form. Check all boxes that apply.

This course introduction leads to changes to:

□ other courses in your unit. Submit a Course Modification proposal for those courses.
□ programs in your unit. Submit Program Modification Forms.
□ courses in other academic units. Requests for Statement of Support Forms are required.
□ program changes in other academic units. Requests for Statement of Support Forms are required.

List all courses and/or programs that are affected, including those in other departments/faculties/colleges/schools. Be as specific as possible.
SECTION G – STATEMENT OF ADDITIONAL COSTS, WORKLOAD, AND/OR SUPPLIES

See the Guidelines for instructions on how to complete this section of the form. Indicate where not applicable.

n/a

SECTION H – PREREQUISITE, COREQUISITE, PRE- OR COREQUISITE, & EQUIVALENCY/MUTUAL EXCLUSIVITY

List all prerequisite, corequisite, pre- or corequisite, equivalent, and mutually exclusive courses, including all applicable previous courses numbers (both Aurora and IMS course numbers). See definitions in the Guidelines.

Indicate as a letter grade where a minimum grade for a prerequisite course, examination, or equivalency test is required. A minimum grade of “C” is assumed. A different minimum grade must be stated. Indicate where concurrency is allowed.

Prerequisites: (MUST be taken before)

consent of the instructor

Pre- or Corequisites (MUST be taken either before or at the same time)

Corequisites (MUST be taken at the same time and not be a spanned course)

Equivalent courses (May NOT be held with existing or former courses with equivalent content, same credit hours, same level. Can be used to meet same program requirements.)

Mutually exclusive courses (May NOT be held with existing or former courses with significant content overlap and/or different credit hours and/or different level or the same course previously offered as a topics course. Cannot be held together for credit or used to meet the same program requirement.)
SECTION I – SUPPORTING DOCUMENTATION ATTACHED

See the Guidelines for information on required supporting documentation.

☑ Course outline (required)
☑ Library statement (normally required)
☑ Request for Statement of Support Forms and responses received
☐ Program Modification Form(s) – included with faculty/college/school submission to SCCCC

SECTION J – SIGNATURES*

Department Approval: ____________________________________________

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Faculty/College/School Approval:

Ben Pak Ching Li  1/14/2021

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*Signatures are not required for Fall 2020 Submissions to SCCCC.
THE UNIVERSITY OF MANITOBA
Topics in Science with Laboratories 3002 (SCI 3002): Scientific Foundations for Computational Finance

Proposal for
A Cross-Disciplinary Course on
Scientific Foundations for Computational Finance

Instructors: Ruppa K. Thulasiraman (Principal Applicant – Professor, Computer Science tulsi@cs.umanitoba.ca);

The purpose of this course is to expose undergraduate Science students to challenging new opportunities for application of their Science background to the field of Computational Finance.

This course is designed to grasp fundamental Mathematics, Statistics, and Computing concepts to apply to the study of Financial Derivatives, particularly Financial Options and discover computational issues in the application.

This course is intended for 3rd year Science students (Math, Stat, Physics or Computer Science) to familiarize a part of world of finance markets, understand underlying Mathematics and Statistics for (a) developing algorithms for some simple finance models; (b) getting first hand experience of formulating finance problems into computational problems;

We expect that this learning experience will bring in a level of confidence in Science students in applying their knowledge to a new and still unfamiliar field for them and incite them to explore this application area further in their career.

Lectures will cover the following topics: Lecture notes will be prepared in consultation and input from the team members.

Week 1: Mathematics of Compounding: (a) Interest and Return; (b) Cash flow and time value of money; (c) Annuities; (d) Yield rates

Week 2-3: Mathematics: Discrete Time Modeling
1. Finite-State economy – Vector Space of Payoffs
2. Asset Pricing: (a) Law of one price; (b) Arbitrage; (c) First Fundamental Theorem of Asset Pricing; (d) Risk-Neutral Probabilities; (e) Second Fundamental Theorem of Asset Pricing
3. Trinomial Model of an Incomplete Market

Assignment 1

Weeks 4-5: Statistics
1. Binomial Probability Model
2. Random Processes
3. Conditional Expectations: (a) Random Variables and Processes; (b) Conditional Expectations; (c) Properties of Conditional Expectations; (d) Conditioning in the Binomial Model; (e) Classification of Stochastic Processes

Assignment 2

Week 6-7: Finance: (a) Introduction; (b) Mechanics of Futures Markets; (c) Hedging Strategies Using Futures; (d) Mechanics of Options Markets; (e) Properties of Stock Options; (f) Trading Strategies Involving Options; (g) Determination of Forward and Futures Prices; (h) Wiener Processes and Ito’s Lemma (Continuous Time Modelling); (i) The Black–Scholes–Merton Model

Assignment 3

Mid Term Test at the end of week 7
THE UNIVERSITY OF MANITOBA
Topics in Science with Laboratories 3002 (SCI 3002): Scientific Foundations for Computational Finance

**Weeks 8-9** Computing Algorithms: (a) Binomial Trees; (b) Basic Numerical Procedures; (c) Monte-Carlo Simulation; (d) Finite-Differencing technique; (e) More on Models and Numerical Procedures

**Weeks 10** Software Tools (how to use the following packages): (a) Excel; (b) Matlab; (c) Comsol (possibly); (d) R, SAS

**Weeks 11-13** Developing Code Advanced topics: (a) Binomial Tree; (b) Monte-Carlo Simulation; (c) Finite-Difference

**Assignment 4**

**Books and Reference Material:** There are many books, publications and on-line sources for documents, and data in addition to lecture notes. The following books will be referred for the curriculum to be taught in this course.


**Format:**

Lectures will be given in-class, 3 hours a week, and there will be a weekly 50-minute tutorial.

**Evaluation:** This course will be graded in three components:

- **Assignments:** 20% (4 assignments)
- **Midterm Exam:** 20%
- **Labs/Tutorials:** 10%
- **Final Exam:** 50%

**Final Grades:**

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**Background knowledge** expected of students: Basic programming skills such as Java (comp1010) or Python (comp1012). MATH 2150 (Multivariable Calculus) and STAT 2400 (Intro to Probability) might be required and highly beneficial.

**Pre-requisite:** Consent of the instructor
Faculty: Science
Department: 
Course #: SCI 3002
Course Name: Topics in Science with Laboratories

The Libraries’ collection can support this new course. We will reallocate budget funds to purchase additional books to support the course.

It is not expected that this proposed change will affect the Libraries’ ability to continue to provide services such as research and teaching support, reference assistance, document delivery, and the technical infrastructure which allows the discovery and delivery of the Libraries’ resources and services.

Please advise the liaison librarian about any future changes to the special topics discussed in this course so that they have an opportunity to assess the collection’s coverage of new topics.

Vickie Albrecht
Acting Head, Sciences Division

Kristen Kruse
Coordinator, Collections Management

Lisa Hanson O’Hara
Vice Provost (Libraries) & University Librarian

November 12, 2020
Date
STATEMENT OF SUPPORT: PART A – REQUEST FOR ACTION
SCCCC Fall 2020/Spring 2021

Complete Sections A through D of this form. Send a copy, together with Part B and any additional supporting documentation, to unit(s) from which you are seeking a statement of support. The completed form (Sections A through E) is to be submitted to SCCC along with Statements of Support (Part B) received. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes.

SECTION A – UNIT REQUESTING STATEMENT OF SUPPORT

Faculty/College/School: Science
Department or Program: Choose one

SECTION B – REASON FOR REQUEST FOR SUPPORT

☐ possible curricular overlap or infringement or conflict of jurisdiction with another unit(s)
☐ possible curriculum/course changes in another unit(s) arising from proposed curriculum/course change in your unit
☒ possible impact on demand (increased or decreased) for a specific course(s) in another unit(s)
☐ other (Please elaborate below, in Section C.)

Request for assessment of course intended to satisfy:

☐ Written English ☐ Mathematics ☐ RIC List

Indicate the SCCC deadline your unit will meet: ☐ Fall 2020 ☒ Spring 2021

Indicate date on which request for support – Part A sent to other unit(s): October 27, 2020
Request that a response be provided by the date indicated: November 15, 2020

SECTION C – DESCRIPTION OF PROPOSED CURRICULUM/COURSE CHANGE

Briefly describe the proposed curriculum/course change in your unit and outline the request for support. Be as specific as possible, including with respect to the potential impact on courses/curricula in the other unit(s).

The Faculty of Science would like to introduce topics courses at the undergraduate level. These courses will tentatively be titled Topics in Science with Laboratories 1, 2, 3 with proposed course numbers SCI 1002, SCI 2002, and SCI 3002 respectively.

These courses complement the existing SCI 1000, 2000, 3000 and 4000 that do not contain a laboratory component.

SECTION D – UNIT(S) RECEIVING REQUEST FOR STATEMENT OF SUPPORT

List the faculties/collages/schools/departments solicited for a statement of support.

Departments of Biological Science, Computer Science, Chemistry, Mathematics, Microbiology, Physics and Astronomy, Statistics

SECTION E – STATEMENT(S) OF SUPPORT RECEIVED

Attach responses received from other units to your faculty/college/school submission to SCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F—UNIT REQUESTING SUPPORT

Faculty/College/School: Science
Department or Program: Choose one

SECTION G—UNIT RESPONDING TO REQUEST

Faculty/College/School: Science
Department or Program: Biological Sciences (071)

SECTION H—RESPONSE TO REQUEST

Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCCC should be aware of.

The Department of Biological Sciences is in support of the creation of these courses. Additional courses in the Integrated Science Program may indirectly affect enrollment in BIOL courses, but and impact is expected to be minimal.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support.
- Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

There is no direct effect on any one course in Biological Sciences.

SECTION J – SIGNATURES*

Department Approval:  Kevin G-E. Scott  27 October 2020

Type Name  Date

Faculty/College/School Approval:

Type Name  Date

*Signatures are not required for Fall 2020 submissions to SCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the *Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes*. The completed form (Part B) is to be returned to the unit requesting support.

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**SECTION F – UNIT REQUESTING SUPPORT**

Faculty/College/School: Science

Department or Program: Choose one

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**SECTION G – UNIT RESPONDING TO REQUEST**

Faculty/College/School: Science

Department or Program: Computer Science (074)

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**SECTION H – RESPONSE TO REQUEST**

Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCCC should be aware of.

Computer Science supports the introduction of the three laboratory courses (SCI 1002, SCI 2002, and SCI 3002) to complement the existing courses (SCI 1000, 2000, 3000 and 4000) as these proposed additions may have no/minimal impact to COMP.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support.
- Indicate when your unit will submit corresponding changes to the SCCC (e.g., Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

As the proposed changes may have no/minimal impact to COMP, no corresponding changes are planned to submit to the SCCC.

SECTION J – SIGNATURES*

Department Approval:  

Carson Leung  

Type Name  

Oct 27 2020  

Date  

Faculty/College/School Approval:

Type Name  

Date  

*Signatures are not required for Fall 2020 submissions to SCCC.
STATEMENT OF SUPPORT: PART B – RESPONSE & ACTION REQUIRED
SCCC Fall 2020/Spring 2021

Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the *Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes*. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School:  Science
Department or Program:  Choose one

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School:  Science
Department or Program:  Chemistry (002)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCCC should be aware of.

The Department of Chemistry supports the introduction of SCI 1002, SCI 2002, and SCI 3002 on condition that it does not adversely impact our program delivery and specifically that the following concerns are addressed:

1) the use of undergraduate teaching laboratories and prep spaces for SCI 1002, SCI 2002 and SCI 3002 do not interfere with the ability of Chemistry to deliver our Chemistry and Biochemistry programs.

2) assignment of Chemistry Faculty to teach SCI 1002, SCI 2002 and SCI 3002 will be on a voluntary basis and minimize the loss of teaching expertise in the programs delivered by Chemistry.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- **Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.**

The proposed introduction of the SCI 1002, 2002 and 3002 courses will likely only modestly impact the enrolment of the majority of courses in the programs offered by the Department of Chemistry. These courses can serve as additional elective options for students in Chemistry and Biochemistry major and honours programs.

SECTION J – SIGNATURES*

Department Approval: Horace Luong November 4, 2020

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Faculty/College/School Approval:

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*Signatures are not required for Fall 2020 submissions to SCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Choose one

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Science
Department or Program: Mathematics (136)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

The Department of Mathematics supports the proposed course introduction. No impacts anticipated.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support.
- Indicate when your unit will submit corresponding changes to the SCCC (e.g., Fall 2020 or Spring 2021). *In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.*

No impacts or further action anticipated.

SECTION J – SIGNATURES*

Department Approval: **Derek Krepski**

Type Name: ____________________________ Date: Nov 2, 2020

Faculty/College/School Approval:

Type Name: ____________________________ Date: ____________________________

*Signatures are not required for Fall 2020 submissions to SCCC.*
STATEMENT OF SUPPORT: PART B – RESPONSE & ACTION REQUIRED
SCCCC Fall 2020/Spring 2021

Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Choose one

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Science
Department or Program: Microbiology (060)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

The department of Microbiology supports the development of interdisciplinary topics courses that include a laboratory components at the 1000, 2000 and 3000 level as proposed by the Faculty of Science. The only possible concern may be that the lab components of these courses, especially with a chemistry, biochemistry or microbiology component be performed in EHSO compliant laboratory settings.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

These courses would have little if any impact on the programs in the department of microbiology. In general these courses would be considered as electives. The department may consider allowing them as a replacement for one course in the options list (maybe the 2000 and 3000 level courses), but that would depend on the details of the course for that year and would be responded to on an individual basis.

SECTION J – SIGNATURES*

Department Approval: Richard Sparling 27 October 2020
Type Name Date

Faculty/College/School Approval:

Type Name Date

*Signatures are not required for Fall 2020 submissions to SCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Choose one

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Science
Department or Program: Physics and Astronomy (016)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

The Department of Physics and Astronomy supports the introduction of SCI 1002, SCI 2002 and SCI 3002, as proposed. This will provide an opportunity for our faculty members to offer special topics courses with an interdisciplinary flavor using these new SCI courses.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

The introduction of SCI 1002, SCI 2002 and SCI 3002 will have no impact on any of our courses or programs; therefore, no further action from the Department of Physics and Astronomy will be needed.

SECTION J – SIGNATURES*

Department Approval:  Khodr Shamseddine  December 4, 2020

Type Name  Date

Faculty/College/School Approval:

Type Name  Date

*Signatures are not required for Fall 2020 submissions to SCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the *Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes*. The completed form (Part B) is to be returned to the unit requesting support.

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**SECTION F – UNIT REQUESTING SUPPORT**

Faculty/College/School: Science  
Department or Program: Choose one

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**SECTION G – UNIT RESPONDING TO REQUEST**

Faculty/College/School: Science  
Department or Program: Statistics (005)

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**SECTION H – RESPONSE TO REQUEST**

Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCCC should be aware of.

The Department of Statistics has no concerns at this point.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

No actions are required from the Department of Statistics as a result of this request.

SECTION J – SIGNATURES*

Department Approval:  Alexandre Leblanc  
Type Name  
November 24, 2020  
Date

Faculty/College/School Approval:

Type Name  
Date

*Signatures are not required for Fall 2020 submissions to SCCC.
SECTION A
Faculty/College/School:   Science
Department or Program:   Choose one
Program (i.e. credential and discipline):   B.Sc. General
Changes Take Effect:   Fall 2021

SECTION B – DESCRIPTION OF PROGRAM MODIFICATION
Provide a brief description of the proposed program modification. Limit – 200 words.
The Faculty of Science is proposing modifications to the B.Sc. General Program (see attached documentation). We will be changing the introductory course requirements to require 9 credit hours from CS/Math/Stats, 6 credit hours from Chemistry/Physics & Astronomy, and 6 credit hours from Biological Sciences/Microbiology.

For the advanced level requirements, we will require 36 hours of 2000 level or higher Faculty of Science courses, with at least 9 credit hours at the 3000 level or higher. We will no longer require these hours be split over two departments, or the Biological Sciences or Chemistry focus options.

Departments will delete the general science chart from their portion of the academic calendar.

SECTION C – RATIONALE
☑ Responds to a recommendation in an external undergraduate program review.
Provide a brief rationale for the program modification in the space provided.

The proposed changes are the conclusion of numerous activities including 1) the recent undergraduate program review, 2) discussions and consultations with departments within the Faculty of Science, 3) student town-halls, and 4) an extensive survey of alumni and current students of the B.Sc. General program.

One of the goals of these changes is to allow students to receive a broad(er) general science education, where students have the opportunity to gain exposure to all the major areas in Science. Another goal is to provide students with flexibility to make choices in their degree, especially beyond year 1, based on their interests and career aspirations.

SECTION D – ACADEMIC CALENDAR CONTENT
Attach a revised program description, including program charts and any other Academic Calendar content that would require updates to reflect course and curriculum changes. Beginning with the program description as it appears in the current Academic Calendar, clearly indicate proposed changes using strikethrough font (e.g. strikethrough) to indicate content that is to be deleted and bold font to indicate content that is to be added.
SECTION E – STATEMENT OF ADDITIONAL COSTS, WORKLOAD, AND/OR SUPPLIES

See the Guidelines for instructions on how to complete this section of the form. Indicate where not applicable.

There will be no impact on courses, workload or costs. In fact, we believe that the proposed changes may lead to some re-distribution of students across Science courses and may provide some relief to over-subscribed courses.

SECTION F – CONSULTATION WITH OTHER UNITS THAT MIGHT BE AFFECTED BY CHANGES

See the Guidelines for instructions on how to complete this section of the form.

☑️ This program modification leads to changes in programs in other units. Requests for Statement of Support Forms are required.

In the space provided, list all programs that are affected, including those in other departments, faculties, colleges, or schools. Be as specific as possible.

USB, Faculty of Arts, Departments of Biological Sciences, Chemistry, Computer Science, Mathematics, Microbiology, Physics & Astronomy, Statistics (these departments were asked to remove charts pertaining to the General degree from their portion of the academic calendar), and the Data Science program.

SECTION G – SUPPORTING DOCUMENTATION ATTACHED

See the Guidelines for information on required supporting documentation. Attach documents in the following order.

☑️ Executive summary (required only for significant program modifications)
☑️ Transition plan (required for significant program modifications)
☑️ Current and revised Academic Calendar content, including program descriptions and charts (required)
☐ SPPC Program Proposal Budget Form
☑️ Request for Statement of Support Forms and responses received

SECTION H – SIGNATURES

Department Approval: ___________________________  Type Name ___________________________  Signature * ___________  Date ___________

Faculty/College/School Approval:

Ben Pak Ching Li  1/7/2021

Type Name ___________________________  Signature * ___________  Date ___________

*Signatures are not required for Spring 2021 submissions to SCCCC.
Executive Summary

An external review of the B.Sc. General program was completed in Spring 2019 and suggested a series of recommendations for the Faculty of Science to consider. Based on this review, the Faculty of Science embarked on a review of the B.Sc. General curriculum and has resulted in the enclosed proposal. Throughout this process, we have consulted with departments within the Faculty of Science, held student townhalls, and executed an extensive survey of alumni and current students of the B.Sc. General program.

In the current proposal that we are submitting, one of the main goals of the changes is to allow students to receive a broad(er) general science education, where students gain exposure to all the major areas of Science. In order to do this, we are moving away from the existing Group A and Group B lists for the introductory level courses in the current program and moving to lists from 3 areas: mathematical/computational sciences, life sciences, and physical sciences. We are also proposing to remove the requirement that students must choose 2 areas of advanced-level Faculty of Science courses, or the requirement to complete either a biological sciences or chemistry focus. Departments have submitted program modifications to remove program charts that appear in their portion of the undergraduate academic calendar.

The changes to the B.Sc. General are:

- For introductory courses requirements, students will need to take:
  1. 9 credit hours from COMP, MATH, and STAT;
  2. 6 credit hours from BIOL, and MBIO;
  3. and 6 credit hours from ASTR, CHEM, and PHYS.

These requirements will replace the existing requirements defined using the Group A and Group B lists. The specific lists of courses that can be used are in the program chart given below. As part of this change, students will now be required to have at least one of HS Chemistry 40S or Physics 40S. This is needed in order to take 6 credit hours of introductory courses from ASTR, CHEM, or PHYS. If a student enters the Faculty of Science without Chemistry or Physics 40S, they will need to take one of the Essentials courses that is currently under development by the Chemistry and Physics departments, another equivalent, or Chemistry or Physics 40S.

- Students will need to take 3 credit hours of Faculty of Science courses (at the 1000 level or higher), beyond the 21 credit hours required in the previous bullet.
- Students need to take 36 credit hours of Faculty of Science courses at the 2000, 3000, or 4000 levels with at least 9 credit hours at the 3000 or 4000 levels.
  - Students are no longer required to complete 18 credit hours in two areas, or complete the Biological Science or Chemistry focus areas. Students will have
more options to take courses across the departments in the Faculty of Science. It will also allow for the use of DATA, and SCI courses to fulfill this requirement. The minimum number of credit hours at the 3000 level and higher is increased to 9 credit hours from the current program’s requirement of 6 credit hours.

Transition Plan

Students who are currently enrolled in the B.Sc. General degree at the time the proposed changes come into effect will have the option to complete their degree requirements under the current academic regulations or the proposed academic regulation for the B.Sc. General degree.
Calendar Entry – 3.2 B.Sc. (General) Degree Academic Regulations (Current)

As approved by 4Cs and Senate in Fall 2020

B.Sc. General Academic Regulations¹

A student must complete 90 credit hours with passing grades (“D” or better) in each course. Please note higher grades are usually required for prerequisite purposes. See course descriptions for details. A student must obtain a minimum grade point average of 2.00 on the 90 credit hours which constitute the degree to qualify for the degree of Bachelor of Science (General).

Students may not exceed 36 credit hours of failures.

Introductory Level Science courses (24 credit hours): Students must select 6 credit hours from each of 3 areas listed below (18 credit hours) in Group A. Additionally, students must select 6 credit hours from any courses listed in Group A and/or Group B.

NOTE: No more than 6 credit hours may be selected from any single subject area for use toward the 24 credit hours of introductory course requirements.

Group A:

Astronomy: ASTR 1810 and ASTR 1830

Biology: BIOL 1020 and BIOL 1030

Chemistry: 6 credit hours from CHEM 1100, CHEM 1110 or CHEM 1120 (or CHEM 1122 and CHEM 1126)¹

Computer Science: COMP 1010 (or COMP 1012²) and COMP 1020

Mathematics: six credit hours chosen from:

- MATH 1200³
- 3 credit hours from MATH 1220³ or MATH 1300³ (or equivalent) (or MATH 1210³),
- 3 credit hours from MATH 1230 or MATH 1500 (or equivalent),
- 3 credit hours from MATH 1232 or MATH 1700 (or equivalent),
- MATH 1240

Microbiology: MBIO 1010 and MBIO 2020
Physics: PHYS 1020 or PHYS 1050; and PHYS 1030 or PHYS 1070

Statistics: STAT 1000⁵ (or STAT 2220⁴) and STAT 2000⁵ or STAT 1150⁵ and STAT 2150⁵

Group B:

BIOL 1410, FORS 2000.

Notes:

1. CHEM 1122 and CHEM 1126 are intended for Engineering students and may not be held for credit with CHEM 1120.
2. COMP 1012 is intended for Engineering students and may not be held for credit with COMP 1010.
3. MATH 1210 is intended for Engineering students and may not be held for credit with MATH 1200, MATH 1220 or MATH 1300.
4. STAT 2220 is intended for Engineering students and may not to be held for credit with STAT 1000 or STAT 1150.
5. It is recommended that students intending to complete their advanced level Science subjects in Statistics or Mathematics choose STAT 1150 and STAT 2150, rather than STAT 1000 and STAT 2000. STAT 1000 and STAT 2000 may not be held for credit with STAT 1150.

Advanced Level Science Courses (36 credit hours): Effective for students entering Science September 2008 or later², to satisfy the advanced level requirements of the 3-year General Degree program, eighteen (18) credit hours at the 2000, 3000, and (or) 4000 level must be chosen from each of two of the following Science departments: Biological Sciences, Chemistry, Computer Science, Mathematics, Microbiology, Physics and Astronomy, and (or) Statistics. Of the 36 credit hours (total) from the advanced areas of study, at least 6 credit hours must be chosen from 3000 or 4000 level courses. Students should note prerequisite requirements for upper level courses when planning their program. Appropriate courses and combinations of courses are detailed in each departmental section. Substitute courses from a department may be taken by obtaining written authorization from the chosen department.

Other Faculty Courses (12 credit hours): a minimum of 12 credit hours must be taken from outside the Faculty of Science, of which at least six credit hours must be from the Faculty of Arts. A maximum of 30 credit hours may be taken from outside the Faculty of Science for use in the General Degree program.
Elective Courses (18 credit hours): 18 credit hours of the B.Sc. General Degree are open electives.

Biological Sciences Option: Students may elect to choose all 36 credit hours of advanced level course requirements from the Department of Biological Sciences provided they follow the specified course selections prescribed in the Biological Sciences Focus Chart - B.Sc. General.

Chemistry Option: Students may elect to choose a specific set of introductory courses, plus all 36 credit hours of the advanced level course requirements from the Department of Chemistry provided they follow the specified course selections (introductory and advanced levels) prescribed in Chemistry Focus Chart - B.Sc. General.

NOTES:

1. Students having difficulty with the interpretation of these regulations or the way in which they are applied, are urged to contact a Science Academic Advisor in the general office. Students are responsible for their own degree progress and completion.

2. Students admitted to the Faculty of Science prior to September 2008 should consult with a Science Academic Advisor about degree requirements.

B.Sc. General Degree Minimum Performance Requirements

Effective September 2013, each student in the Faculty of Science will be placed on academic suspension for one year, regardless if there has been evidence of improved performance, if they have more than 36 credit hours of "F" grades.

Following a one year suspension, the student may return upon application to the Faculty of Science by selecting one of the following irreversible options:

(a) to continue with no possibility of further "F" grades. Any further "F" grades will result in academic suspension for two years. (Following the two year suspension, the student may apply to the Faculty of Science to return to start afresh.)

(b) start afresh, with their previous work not counting towards satisfying degree requirements. Students may appeal to transfer in up to 30 credit hours of coursework previously completed with a grade of "C" or better.

(In either case this does not mean that the previous coursework will be removed from the student history or transcript.)

B.Sc. General Degree Residence Requirements
There are two ways in which students may fulfill the minimum requirement of credit hours that must be taken at the University of Manitoba: by taking at least 48 credit hours at the University of Manitoba; or by taking at least the final 30 credit hours at the University of Manitoba. The courses used to satisfy the residence requirement must be acceptable for credit in the Faculty of Science. Residency requirements apply to both first and second degree students.

Calendar Entry - B.Sc. (General) Degree Academic Regulations
(Proposed)

3.2 B.Sc. (General) – Three Year Degree

The three-year General program is intended to provide diversified training in Science. The program provides students with broad exposure to major areas of Science at the introductory level with a requirement for more advanced studies in one or more areas of Science.

This program is not intended for students who desire to practice in some field of specialization in the Sciences. Students with that intent are recommended to pursue the Honours or the four-year Major program.

Students are required to have the equivalent of high school Mathematics 40S (either pre-calculus or applied mathematics) and at least one of high school Chemistry 40S or Physics 40S.

B.Sc. General Academic Regulations

A student must complete 90 credit hours with passing grades (“D” or better) in each course. Please note higher grades are usually required for prerequisite purposes. See course descriptions for details. A student must obtain a minimum grade point average of 2.00 on the 90 credit hours, which constitute the degree to qualify for the degree of Bachelor of Science (General).

Introductory Level Faculty of Science courses (21 credit hours):

Students must complete:

- 9 credit hours from the Computational and Mathematical Sciences:
  - COMP 1010 (or COMP 1012), COMP 1020,
  - [(MATH 1220 or MATH 1300 (or equivalent)) or(MATH 1210)], [MATH 1230 or MATH 1500 (or equivalent)], MATH 1240,
  - [STAT 1000 (or STAT 2220) or STAT 1150], STAT 2000, STAT 2150

- 6 credit hours from the Physical Sciences:

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ASTR 1810, ASTR 1830,
CHEM 1100, CHEM 1110, [CHEM 1120 or (CHEM 1122 and CHEM 1126)\(^7\)],
( PHYS 1020 or PHYS 1050), (PHYS 1030 or PHYS 1070), PHYS 2152\(^8\)

- 6 credit hours from the Life Sciences:
  - BIOL 1020, BIOL 1030, BIOL 1410, BIOL 1412
  - MBIO 1010, MBIO 1220

Notes:

1. When selecting courses to fulfill the Introductory Faculty of Science requirement, a student should consider the subject areas in which they wish to select Advanced Level Faculty of Science courses, and select courses that will fulfill the prerequisite requirements of the Advanced Level courses. A student is encouraged to consult course descriptions and an academic advisor for guidance. Students must satisfy the W requirement, within the first 60 credit hours.

2. COMP 1012 is intended for Engineering students and may not be held for credit with COMP 1010.

3. MATH 1210 is intended for Engineering students and may not be held for credit with MATH 1220 or MATH 1300 (or equivalent).

4. STAT 2220 is intended for Engineering students and may not to be held for credit with STAT 1000 or STAT 1150.

5. STAT 1150 may not be held for credit with STAT 1000 or STAT 2000.

6. Students must have at least one of High School Chemistry 40S or Physics 40S. Students who do not have either of these high school courses will not be able to satisfy this requirement without taking CHEM 1018, PHYS 1018, or another equivalent. CHEM 1018 or PHYS 1018 may be used to fulfill the Faculty of Science requirement, or an elective requirement.

7. CHEM 1122 and CHEM 1126 are intended for Engineering students and may not be held for credit with CHEM 1120.

8. PHYS 2152 is intended for Engineering students and may not be held for credit with PHYS 1070.

Advanced Level Faculty of Science Courses (36 credit hours):

To satisfy the advanced level requirements of the 3-year General Degree program, thirty-six (36) credit hours at the 2000, 3000, and (or) 4000 level must be chosen from courses offered by the Faculty of Science. Courses offered by the Faculty of Science include courses from the departments of Biological Sciences, Chemistry, Computer Science, Mathematics, Microbiology,
Physics & Astronomy, and Statistics. Courses with the prefix DATA, FORS, and SCI, are also courses taught by the Faculty of Science and maybe used to fulfill this requirement.

Of these 36 credit hours, at least 9 credit hours must be chosen from 3000 or 4000 level courses.

Students should note prerequisite requirements for upper level courses when planning their program.

PHYS 2152, SCI 3980, SCI 3990, SCI 4980, SCI 4990, STAT 2000, and STAT 2220 may not be used to fulfill this requirement.

Other Course Requirements (33 credit hours)

- Faculty of Science Elective course (3 credit hours):

  In addition to the 57 credit hours of Faculty of Science courses stated above, students must take an additional 3 credit hours from the Faculty of Science. This course must be at the 1000-level or higher.

- Other Faculty Courses (12 credit hours):

  Students must take a minimum of 12 credit hours of courses from outside the Faculty of Science, of which at least six credit hours must be from the Faculty of Arts. Students may take up to 30 credit hours of courses from outside of the Faculty of Science using the 18 credits of electives below.

- Elective Courses (18 credit hours):

  Students must take 18 credit hours of electives in this program. Elective courses may include courses from within the Faculty of Science, or courses from other faculties.

B.Sc. General Degree Minimum Performance Requirements

Students in the B.Sc. General Degree program are subject to academic assessment regulations as specified in Section 3.1 (Regulations Applicable to all Programs) of the Faculty of Science section of the general calendar.

B.Sc. General Degree Residence Requirements

There are two ways in which students may fulfill the minimum requirement of credit hours that must be taken at the University of Manitoba: by taking at least 48 credit hours at the University of Manitoba; or by taking at least the final 30 credit hours at the University of Manitoba. The
courses used to satisfy the residence requirement must be acceptable for credit in the Faculty of Science. Residency requirements apply to both first and second degree students.

**B.Sc. General (Revised) Program Chart**

<table>
<thead>
<tr>
<th>YEAR 1</th>
<th>YEAR 2</th>
<th>YEAR 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 Credit Hours from COMP, MATH or STAT²</td>
<td>27 Credit Hours at the 2000 level or higher from the Faculty of Science.⁶</td>
<td>9 Credit Hours at the 3000 level or higher from the Faculty of Science.</td>
</tr>
<tr>
<td>6 Credit Hours from ASTR, CHEM or PHYS³,⁴</td>
<td>6 Credit Hours from BIOL or MBIO⁵</td>
<td>3 Credit Hours of Faculty of Science courses.</td>
</tr>
<tr>
<td>12 Credit Hours from outside the Faculty of Science, of which at least six credit hours must be from the Faculty of Arts.</td>
<td>18 Credit Hours of electives.</td>
<td></td>
</tr>
<tr>
<td>30 Hours</td>
<td>30 Hours</td>
<td>30 Hours</td>
</tr>
</tbody>
</table>

**Comments/Notes:**

1. Student must satisfy the W requirement within their first 60 credit hours.
2. Chosen from (COMP 1010 or COMP 1012), COMP 1020, [MATH 1220 or MATH 1300 (or equivalent), or MATH 1210], [MATH 1230 or MATH 1500 (or equivalent)], [MATH 1232 or MATH 1700 (or equivalent)], MATH 1240, (STAT 1000 or STAT 2220 or STAT 1150), STAT 2000, STAT 2150.
3. Chosen from ASTR 1810, ASTR 1830, CHEM 1100, CHEM 1110, [CHEM 1120 or (CHEM 1122 and CHEM 1126)], (PHYS 1020 or PHYS 1050), [PHYS 1030 or (PHYS 1070 or PHYS 2152)].
4. Student must have at least one of high school Chemistry 40S or Physics 40S, or equivalent.
5. Chosen from BIOL 1020, BIOL 1030, BIOL 1410, BIOL 1412, MBIO 1010, MBIO 1220.
6. PHYS 2152, SCI 3980, SCI 3990, SCI 4980, SCI 4990, STAT 2000, STAT 2220 cannot be used to satisfy this requirement.

**Additional Notes:**

1. Students having difficulty with the interpretation of these regulations or the way in which they are applied, are urged to contact a Science Academic Advisor in the general office. Students are responsible for their own degree progress and completion.

2. Students admitted into the B.Sc. General degree program prior to September 2021 should consult with a Science Academic Advisor about degree requirements.
STATEMENT OF SUPPORT: PART A – REQUEST FOR ACTION
SCCCC Fall 2020/Spring 2021

Complete Sections A through D of this form. Send a copy, together with Part B and any additional supporting documentation, to unit(s) from which you are seeking a statement of support. The completed form (Sections A through E) is to be submitted to SCCC along with Statements of Support (Part B) received. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes.

SECTION A – UNIT REQUESTING STATEMENT OF SUPPORT
Faculty/College/School: Science
Department or Program: Choose one

SECTION B – REASON FOR REQUEST FOR SUPPORT
☐ possible curricular overlap or infringement or conflict of jurisdiction with another unit(s)
☐ possible curriculum/course changes in another unit(s) arising from proposed curriculum/course change in your unit
☐ possible impact on demand (increased or decreased) for a specific course(s) in another unit(s)
☑ other (Please elaborate below, in Section C.)
Request for assessment of course intended to satisfy:
☐ Written English ☐ Mathematics ☐ RIC List

Indicate the SCCC deadline your unit will meet: ☐ Fall 2020 ☑ Spring 2021

Indicate date on which request for support – Part A sent to other unit(s): 1/7/2020
Request that a response be provided by the date indicated: 1/10/2020

SECTION C – DESCRIPTION OF PROPOSED CURRICULUM/COURSE CHANGE
Briefly describe the proposed curriculum/course change in your unit and outline the request for support. Be as specific as possible, including with respect to the potential impact on courses/curricula in the other unit(s).

The Faculty of Science is making modifications to the B.Sc. General Program (see attached documentation). We will be changing the introductory course requirements to require 9 credit hours from CS/Math/Stats, 6 credit hours from Chemistry/Physics & Astronomy, and 6 credit hours from Biological Science/Microbiology.

For the advanced level requirements, we will require 36 hours of 2000 level or higher science courses, with at least 9 credit hours at the 3000 level or higher. We will no longer require these hours be split over two departments, or do the Biological Sciences or Chemistry options. Departments will be asked to delete the general science chart from their portion of the academic calendar.

SECTION D – UNIT(S) RECEIVING REQUEST FOR STATEMENT OF SUPPORT
List the faculties/colleges/schools/departments solicited for a statement of support.

Faculty of Arts, Université de Saint-Boniface, Department of Biological Science, Department of Computer Science, Department of Chemistry, Department of Mathematics, Department of Microbiology, Department of Physics & Astronomy, Department of Statistics, Data Science.

SECTION E – STATEMENT(S) OF SUPPORT RECEIVED
Attach responses received from other units to your faculty/college/school submission to SCCC.
STATEMENT OF SUPPORT: PART B – RESPONSE & ACTION REQUIRED
SCCCC Fall 2020/Spring 2021

Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Choose one

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Arts [Faculty of]
Department or Program: Choose one

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCCC should be aware of.

The Faculty of Arts supports these changes. We do not anticipate any impacts on course/curricula in our unit.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support.
- Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

N/A

SECTION J – SIGNATURES

Department Approval:  
Heidi Marx-Wolf  
Type Name: Heidi Marx-Wolf  
Signature: *  
Date: December 22, 2020

Faculty/College/School Approval:  
Greg T. Smith  
Type Name: Greg Smith  
Signature: *  
Date: 4 Jan 2021

*Signatures are not required for Spring 2021 submissions to SCCC.
SECTION F - UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Choose one

SECTION G - UNIT RESPONDING TO REQUEST
Faculty/College/School: Université de Saint-Boniface
Department or Program: sciences, Faculte des (USB)

SECTION H - RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

USB's Faculté des arts et des sciences a Université de Saint-Boniface supports the proposed changes from the faculty of Science. These proposal modifications to the B.Sc. General Program will change all the structure of the B.Sc. general program and will have a impostant consequences on our program.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- Indicate when your unit will submit corresponding changes to the SCCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCCC deadline indicated on the preceding page, in Section B.

USB’s Faculté des arts et des sciences will consult and consider whether similar curricular changes should be submitted for USB programs.

SECTION J – SIGNATURES

Department Approval: Mathias Oulé December 21, 2020

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<th>Type Name</th>
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Faculty/College/School Approval:

Alexandre Brassard December 21, 2020

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<th>Type Name</th>
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*Signatures are not required for Spring 2021 submissions to SCCCC.*
STANLEO OF SUPPORT: PART B - RESPONSE & ACTION REQUIRED  
SCCC Fall 2020/Spring 2021

Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT

Faculty/College/School: Science
Department or Program: Choose one

SECTION G – UNIT RESPONDING TO REQUEST

Faculty/College/School: Science
Department or Program: Biological Sciences (071)

SECTION H – RESPONSE TO REQUEST

Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

The proposed removal of the Biology Focus in the 3-Year General degree could be advantageous to our Department. Currently, all students in this focus have to take two 2nd-year BIOL courses out of a list of seven. This puts a great deal of pressure on these oversubscribed courses which generally have wait lists as long as their class lists. Removal of this requirement may significantly reduce this pressure.

The impact on students in the 3-year GenSci program, however, may not always be beneficial. With the removal of a structured list of courses in Biology, students will be able to choose courses more freely. This is a clear benefit until a student wishes to transfer into a 4-year Biology majors or honours degree. Without a structure recommending specific courses, these students will likely be missing several PQs that a fourth-years student would have. This could potentially add years to their studies.

One other future, political concern was the potential reduction of biology courses taken and the biology-literacy of graduates of the proposed general degree. A deeper understanding of biological concepts is important in considering such political issues include climate change and the environment. This concern, however, may be offset by a broader range of science courses taken improving overall science literacy in these graduates.

Overall, the Department of Biological Sciences is in favour of this modification on the condition that all students entering Science be strongly advised to declare a ‘four-year degree to begin with. It would be far easier for a student to transfer into a three-year program if they choose.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- **Indicate when your unit will submit corresponding changes to the SCCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCCC deadline indicated on the preceding page, in Section B.**

If anything, this change is expected to reduce the pressure on our second year courses. Even if more students declare themselves as Biology majors/honours students needing our courses, this increase would likely be offset be the decrease in GenSci students.

SECTION J – SIGNATURES

Department Approval: Kevin G-E. Scott

<table>
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<th>Kevin Scott</th>
<th>16 December 2020</th>
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<tbody>
<tr>
<td>Type Name</td>
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Faculty/College/School Approval:

<table>
<thead>
<tr>
<th>Ben Pak Ching Li</th>
<th>1/10/2021</th>
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*Signatures are not required for Spring 2021 submissions to SCCCC.
STATEMENT OF SUPPORT: PART B – RESPONSE & ACTION REQUIRED
SCCC Fall 2020/Spring 2021

Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Choose one

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Science
Department or Program: Computer Science (074)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCCC should be aware of.

Computer Science supports these modifications to 3-year BSc(Gen) program as the changes allow students to receive a broader general science education and appear to have no negative impact to COMP.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- Indicate when your unit will submit corresponding changes to the SCCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCCC deadline indicated on the preceding page, in Section B.

In consistent to the proposed program modifications, COMP will submit to the SCCCC the corresponding changes to remove the General program charts listed in the COMP sections of the general calendar.

SECTION J – SIGNATURES

Department Approval:  
Carson Leung  
Dec 18 2020

Type Name  Signature*  Date

Faculty/College/School Approval:

Ben Pak Ching Li  
1/10/2021

Type Name  Signature*  Date

*Signatures are not required for Spring 2021 submissions to SCCC.
STATEMENT OF SUPPORT: PART B – RESPONSE & ACTION REQUIRED
SCCC Fall 2020/Spring 2021

Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Choose one

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Science
Department or Program: Chemistry (002)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

In this new 3-year General program, students will need to choose six credit hours of courses from the physical sciences (physics, astronomy and chemistry). Therefore the enrolment in CHEM 1100, CHEM 1110, and CHEM 1120 will be impacted although it is unclear at this point to which direction. Effective fall 2021, CHEM/MBIO 2730, CHEM 2740, CHEM/MBIO 2750 are courses that will replace CHEM/MBIO 2770 and CHEM/MBIO 2780 and these two courses were not counted as advanced science courses in the current 3-year General program. CHEM/MBIO 2730, CHEM 2740, and CHEM/MBIO 2750 will be acceptable advance science courses in the proposed 3-year General program so we anticipate that there will be increased enrolment in these courses - the prerequisites for these biochemistry courses is not as demanding as CHEM/MBIO 2700, CHEM/MBIO 2710 and CHEM 2720.

Students who pursue the 3-Year B.Sc. General will likely have a difficult time transitioning into a Chemistry or Biochemistry Major/Honours because 9 credit hours of chemistry are required in the first year to get into all of the essential 2000-level chemistry courses. Due to the rigidly prescribed first year requirements, there may not be many students who will take all 9 credit hours of chemistry and therefore they would be delayed by about a term to a year in starting the 2000-level courses. Since the program description informs the students that it isn’t for those who want specialization, we’ve accepted that it is a general science education degree and the students who pursue it will likely not transition into our Department’s programs. Therefore the Department of Chemistry supports the modified 3-Year B.Sc. General program.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

CHEM 1100, CHEM 1110, CHEM 1120, CHEM/MBIO 2730, CHEM 2740, CHEM/MBIO 2750
All of the listed 1000-level chemistry courses are possible courses that 3-year B.Sc. General students could enrol in. Due to their less demanding prerequisite requirements, we expect an increase in enrolment in the biochemistry courses of CHEM/MBIO 2730, CHEM 2740, and CHEM/MBIO 2750 as a result of this proposed 3-Year General program.

3-Year B.Sc. General - Chemistry Focus
This degree will no longer be available if the proposed 3-Year B.Sc. General is approved and therefore will have to be deleted from the academic calendar program charts for Chemistry.

B.Sc. Honours in Chemistry (inc. Co-op), B.Sc. Major in Chemistry (inc. Co-op), B.Sc. Chemistry-Physics,
- Due to the strict options of first-year courses, we expect a decrease in students transitioning from a 3-Year General program to an Honours/Major program.

Chemistry will be submitting changes to SCCC for Spring 2021.

SECTION J – SIGNATURES

Department Approval: ______________________________________________________________________

Horace Luong

January 6, 2021

Type Name Signature Date

Faculty/College/School Approval:

Ben Pak Ching Li

1/10/2021

Type Name Signature Date

*Signatures are not required for Spring 2021 submissions to SCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Choose one

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Science
Department or Program: Mathematics (136)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCCC should be aware of.

The Dept of Mathematics supports this request. No significant impact anticipated.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- **Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.**

In response to this, Mathematics proposes to remove the BSc General Mathematics Program Chart, as indicated in Section B in Spring 2021.

SECTION J – SIGNATURES

Department Approval: Derek Krepski

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Faculty/College/School Approval:

Ben Pak Ching Li

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*Signatures are not required for Spring 2021 submissions to SCCC.
SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Choose one

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Science
Department or Program: Microbiology (060)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

The Department of Microbiology supports the changes to the General Degree Program, with the following comments.

Students will most likely take the pair of courses BICL 1020/BIOL 1030 in year one, which may suggest to students that MBIO 1010 should be taken in year two, although it could be completed in year one.

The recommendation for completion of HS Chemistry 40S or Physics 40S before entering the program is a good one. Chemistry 40S (or the University of Manitoba equivalent) is important for students planning to include MBIO courses in their 3-year programs.

While breadth is the goal, the lack of defined clusters of courses may not increase diversity in courses taken across the faculty as much as is expected, due to the need to complete prerequisite courses. Further, while the increase in credit hours at the 3000 level to 9 is a positive change, students will need very clear and detailed information from departments and the faculty for planning purposes, as department-specific information on recommended courses cannot be included in the revised calendar descriptions.

Could the following be added as a note in the program charts? MBIO 1220 is designed for pre-Nursing students and cannot be used as a prerequisite for further MBIO courses.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support.
- Indicate when your unit will submit corresponding changes to the SCCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCCC deadline indicated on the preceding page, in Section B.

This is a modification to the BSc General degree. The removal of specific areas of concentration is not expected to increase demand for MBIO courses. An increased effort in advising students at the department and faculty level is anticipated given that the path of prerequisites needed to toward some higher level courses in specific departments may not be as clear, given the broad flexibility of the program.

Changes will be submitted in Spring 2021.

SECTION J – SIGNATURES

Department Approval: Richard Sparling

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Faculty/College/School Approval:

Ben Pak Ching Li

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*Signatures are not required for Spring 2021 submissions to SCCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Choose one

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Science
Department or Program: Physics and Astronomy (016)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

The Department of Physics and Astronomy supports the proposed changes in the 3-Year B.Sc. general degree. Those changes have no impact on any of our Major, Honours or joint Honours programs; they may affect enrollment in our courses (slightly upward or downward.)

See next page.
SECTIOIII – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

As stated in Section H above, the proposed changes have no direct impact on any of our Major or Honours programs; but they may slightly affect enrollment in our upper-level courses. We will submit changes to remove the General B.Sc. program chart listed in the Physics and Astronomy’s section of the general calendar.

SECTION J – SIGNATURES

Department Approval: Khodr Shamseddine
Type Name
Digitally signed by Khodr Shamseddine
Date: 2020.12.22 23:57:03-06'00'
December 23, 2020
Signature

Faculty/College/School Approval:

Ben Pak Ching Li
Type Name
Signature
1/10/2021
Date

*Signatures are not required for Spring 2021 submissions to SCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Choose one

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Science
Department or Program: Statistics (005)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

The Department of Statistics supports the suggested changes to the three-year General Degree, and in particular, the deletion of areas of concentration. These changes could have some relatively small impact by reducing enrollments in some of our 2000 level courses (2400 and 2800 in particular), but that is not a concern at this point.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support.
- Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

The Department of Statistics is submitting, alongside the changes supported with this form, program changes in order to delete the Statistics concentration of the three-year General Degree.

SECTION J – SIGNATURES

Department Approval: Alexandre Leblanc  
Type Name  Signature *  Date  
December 17, 2020

Faculty/College/School Approval:  
Ben Pak Ching Li  
Type Name  Signature *  Date  
1/10/2021

*Signatures are not required for Spring 2021 submissions to SCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Choose one

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Science
Department or Program: Choose one Data Science

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCCC should be aware of.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support.
- **Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.**

SECTION J – SIGNATURES

Department Approval:  

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<th>Signature</th>
<th>01/21/2021</th>
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Faculty/College/School Approval:

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*Signatures are not required for Spring 2021 submissions to SCCC.*
SECTION A
Faculty/College/School: Science
Department or Program: Chemistry (002)
Program (i.e. credential and discipline): B.Sc. Honours & Major in Biochemistry (incl Coop)
Changes Take Effect: Fall 2021

SECTION B — DESCRIPTION OF PROGRAM MODIFICATION
Provide a brief description of the proposed program modification. Limit – 200 words.
The JMCCB is proposing to modify the B.Sc. Honours and Major Programs in response to the deletion and introduction of courses in the Microbiology department. Specifically, the deletion of MBIO 3030, 3280, 3470, the proposed deletion of MBIO 4670, and the introduction of MBIO 3032, 3282, 3472, and 3700.

SECTION C — RATIONALE
☐ Responds to a recommendation in an external undergraduate program review.

Provide a brief rationale for the program modification in the space provided.

Recently the Microbiology department deleted courses that were available to students in the Biochemistry Honours and Major programs. Additionally, the Microbiology department introduced new courses to replace the deleted courses. The program modification is in response to these deletions and additions.

SECTION D — ACADEMIC CALENDAR CONTENT
Attach a revised program description, including program charts and any other Academic Calendar content that would require updates to reflect course and curriculum changes. Beginning with the program description as it appears in the current Academic Calendar, clearly indicate proposed changes using strikethrough font (e.g. strikethrough) to indicate content that is to be deleted and bold font to indicate content that is to be added.
SECTION E – STATEMENT OF ADDITIONAL COSTS, WORKLOAD, AND/OR SUPPLIES

See the Guidelines for instructions on how to complete this section of the form. Indicate where not applicable.

n/a

SECTION F – CONSULTATION WITH OTHER UNITS THAT MIGHT BE AFFECTED BY CHANGES

See the Guidelines for instructions on how to complete this section of the form.

☐ This program modification leads to changes in programs in other units. Requests for Statement of Support Forms are required.

In the space provided, list all programs that are affected, including those in other departments, faculties, colleges, or schools. Be as specific as possible.

Microbiology; USB

SECTION G – SUPPORTING DOCUMENTATION ATTACHED

See the Guidelines for information on required supporting documentation. Attach documents in the following order.

☐ Executive summary (required only for significant program modifications)
☐ Transition plan (required for significant program modifications)
☑ Current and revised Academic Calendar content, including program descriptions and charts (required)
☐ SPCC Program Proposal Budget Form
☑ Request for Statement of Support Forms and responses received

SECTION H – SIGNATURES

Department Approval: Mazdak Khajehpour Dec 17, 2020

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Faculty/College/School Approval:

Ben Pak Ching Li 1/10/2021

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*Signatures are not required for Spring 2021 submissions to SCCCC.
4.2 Biochemistry

4.2.1 Program Information

Biochemistry Honours Degree Requirements

To enter the joint Honours program in Biochemistry, a student must have completed at least 24 credit hours with a minimum DGPA of 3.00 and also obtained a minimum grade of "B" in CHEM 1110 and a minimum grade of "C+" in CHEM 1120 and BIOL 1020. CHEM 1100, BIOL 1030, PHYS 1050 (or PHYS 1020), MATH 1500, STAT 1150 (or STAT 1000), and 6 credit hours from the Faculty of Arts, including a course that satisfies the "W" requirement are required courses in the program and students are strongly encouraged to complete them in first year.

To continue in the Biochemistry Joint Honours program, students must maintain a minimum DGPA of 3.00, and complete a minimum of 9 credit hours during each Fall and Winter Term.

To graduate with the Biochemistry Joint Honours degree, a student must achieve a minimum DGPA of 3.00 and obtain a minimum grade of "C" on the courses that make up the 120 credit hours of the degree.

Chemistry and Microbiology Optional Courses for Biochemistry Honours Students:

Chemistry: CHEM 2300, CHEM 2600, CHEM 3100, CHEM 3120 (2), CHEM 3300, CHEM 3320 (2), CHEM 3500, CHEM 3520 (2), CHEM 3600, CHEM 3820 (2), CHEM 3840, CHEM 4100, CHEM 4110, CHEM 4130, CHEM 4150, CHEM 4170, CHEM 4360, CHEM 4620, CHEM 4670, CHEM 4800, CHEM 4802, CHEM 4804.

Microbiology: MBIO 3000, MBIO 3010, MBIO 3030 3032, MBIO 3280 3282, MBIO 3430, MBIO 3450, MBIO 3460, MBIO 3470 3472, MBIO 3600, MBIO 3700, MBIO 4020, MBIO 4030, MBIO 4032, MBIO 4410, MBIO 4440, MBIO 4480, MBIO 4520, MBIO 4540, MBIO 4600, MBIO 4602, MBIO 4610, MBIO 4670 (or MBIO 4672).

Optional courses no longer offered that may be used if taken prior to their deletion: CHEM 2260, CHEM 2290, CHEM 2400, CHEM 2470, CHEM 3260, CHEM 3360, CHEM 3370, CHEM 3380, CHEM 3380, CHEM 3380, CHEM 3400, CHEM 3490, CHEM 3580, CHEM 3590, CHEM 4600, CHEM 4660, CHEM 4670, CHEM 4690, CHEM 2280, MBIO 3030, MBIO 3280, MBIO 3440, MBIO 3470, MBIO 3480, MBIO 4010, MBIO 4320, MBIO 4470, MBIO 4510, MBIO 4570, MBIO 4580, MBIO 4600, MBIO 4610, and MBIO 4670. NOTE: Several of these courses may not be held with current course offerings found on the above optional course lists. Please refer to the course descriptions for more information about specific course restrictions.

Biochemistry Four-Year Major Degree Requirements

To enter the joint four-year Major program, a student must have completed a minimum of 24 credit hours with a minimum DGPA of 2.00, and also obtained a minimum grade of "C+" in CHEM 1110, and a minimum grade of "C" in CHEM 1120 and BIOL 1020. CHEM 1100, BIOL 1030, PHYS 1050 (or PHYS 1020), MATH 1500, and STAT 1150 (or STAT 1000), and 6 credit hours from the Faculty of Arts, including a course that satisfies the "W" requirement are required courses in the program and students are strongly encouraged to complete these courses in first year.

To continue in the Bachelor of Science Major degree program, students must maintain a minimum DGPA of 2.00.

To graduate with the Bachelor of Science Major in Biochemistry, a student must complete 120 credit hours or more, with minimum grades of "C+" on all Major Program Specific courses (see below), passing grades ("D" or better) on the remaining courses, and a minimum DGPA of 2.00.

Major Program-Specific Courses:

Chemistry: CHEM 2100, CHEM 2110, CHEM 2122, CHEM 2510, CHEM 2520 (2), CHEM 2700 (MBIO 2700), CHEM 2710 (MBIO 2710), CHEM 2720 (MBIO 2720), CHEM 3700, CHEM 3760 (4), CHEM 4630 and whichever one of CHEM 4360, and CHEM 4620 is selected.

Microbiology: MBIO 1010, MBIO 2020, MBIO 3410, and whichever one of BIOL 2520, MBIO 3450, MBIO 3460, MBIO 4540 or MBIO 4612 is selected.

Students in this program should note the following:

Students must satisfy any course prerequisites and co-requisites for courses selected. Care should be taken to select courses in their proper sequence, e.g. CHEM 2710 (MBIO 2710) and MBIO 2020 should be taken in Year 2 as they are prerequisite to a number of subsequent required or optional courses.

Normally 4000 level courses are available only to students in their fourth year. MBIO 4530 and MBIO 4670 are not available to Major students.

Students are encouraged to elect other courses pertinent to the study of biochemistry although this is not required for completion of the degree. The departments of Microbiology and Chemistry will be glad to suggest such supplementary courses upon request.

Students who may wish to transfer to the Honours program in Biochemistry following Year 2 should be sure to complete all courses recommended in Year 2 (see the chart below).
Honours and Major Co-operative Options

A co-operative education option is available for both Major and Honours students. Students should refer to Section 3.5 of this chapter for further information on the Co-op programs.

Honours Co-op

The course, grade requirements and minimum DGPA requirement for entry and continuation in the Co-operative Option are the same as that for regular Honours program.

Students are required to complete the first and second year requirements of the program and MBIO 3410 before beginning their first co-op work term.

Major Co-op

The course and minimum grads requirements for entry and continuation in the Co-operative Option are the same as those required for the regular Major program. However, the entry and continuation DGPA requirement is set at a minimum of 2.5.

Students are encouraged, but not required, to take 15 credit hours in each academic term in the third and subsequent years. Students are required to complete the first- and second-year requirements of the program and MBIO 3410 before beginning their first co-op work term.
### 4.2.2 Biochemistry Programs (offered Jointly by the Departments of Chemistry and Microbiology)

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<td><strong>JOINT HONOURS</strong> 120 CREDIT HOURS</td>
<td><strong>JOINT HONOURS</strong> 120 CREDIT HOURS</td>
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<td>CHEM 4830, (CHEM 4710 (6) or MBIO 4530 (6))</td>
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<td>PHYS 1050 (or PHYS 1020)</td>
<td>MBIO 1010⁴, MBIO 2020</td>
<td>MBIO 3410</td>
<td>9 credit hours from: MBIO 3450, MBIO 3480, CHEM 4360, CHEM 4620, MBIO 4540, MBIO 4612</td>
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<td>MATH 1500²</td>
<td>STAT 1150 (or STAT 1000)</td>
<td>18 credit hours selected from the list of Microbiology and Chemistry optional courses (listed above). Of these 18 credit hours, at least 6 hours must be 4000 level courses.</td>
<td>12 credit hours selected from the Faculty of Science⁵.</td>
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<td>In Year 1 or Year 2 the following must be completed:</td>
<td>6 credit hours from the Faculty of Arts including the University Written English “W” requirement²</td>
<td>24 credit hours selected from the list of Chemistry and Microbiology Optional courses listed above. Of these 24 credit hours, at least 12 hours must be 4000 level courses.</td>
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<td><strong>JOINT HONOURS CO-OPERATIVE OPTION¹</strong> 120 CREDIT HOURS</td>
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<td>PHYS 1050 (or PHYS 1020)</td>
<td>MBIO 1010⁴, MBIO 2020</td>
<td>9 credit hours from: MBIO 3450, MBIO 3480, CHEM 4360, CHEM 4620, MBIO 4540, MBIO 4612</td>
<td>12 credit hours selected from the Faculty of Science⁵.</td>
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<td>STAT 1150 (or STAT 1000)</td>
<td>In Year 1 or Year 2 the following must be completed:</td>
<td>Co-op Requirements: SCI 3980, SCI 3990, SCI 4980, and SCI 4990 (if a 4th work term is selected).</td>
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<td>6 credit hours from the Faculty of Arts including the University Written English “W” requirement²</td>
<td>6 credit hours from the Faculty of Arts including the University Written English “W” requirement²</td>
<td>21 credit hours of Chemistry and Microbiology (minimum 6 credit hours from each dept.). Of these 21 credit hours, at least 12 hours must be 4000 level courses.</td>
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<td>30 Hours</td>
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<td><strong>JOINT FOUR YEAR MAJOR</strong> (Including Co-operative Option¹) 120 CREDIT HOURS</td>
<td><strong>JOINT FOUR YEAR MAJOR</strong> (Including Co-operative Option¹) 120 CREDIT HOURS</td>
<td><strong>JOINT FOUR YEAR MAJOR</strong> (Including Co-operative Option¹) 120 CREDIT HOURS</td>
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<td>STAT 1150 (or STAT 1000)</td>
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<td>6 credit hours from the Faculty of Arts including the University Written English “W” requirement²</td>
<td>6 credit hours from the Faculty of Arts including the University Written English “W” requirement²</td>
<td>21 credit hours of Chemistry and Microbiology (minimum 6 credit hours from each dept.). Of these 21 credit hours, at least 12 hours must be 4000 level courses.</td>
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<tr>
<td>30 Hours</td>
<td>29 Hours</td>
<td>31 Hours</td>
<td>30 Hours</td>
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<tr>
<td><strong>Co-op Requirements (if selected):</strong></td>
<td><strong>Co-op Requirements (if selected):</strong></td>
<td><strong>Co-op Requirements (if selected):</strong></td>
<td><strong>Co-op Requirements (if selected):</strong></td>
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<td>NOTES:</td>
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<tr>
<td>1 CHEM 1126 may be used in lieu of CHEM 1120.</td>
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<tr>
<td>2 MATH 1230 or MATH 1510 or MATH 1520 or MATH 1690 may be taken in place of MATH 1500.</td>
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<tr>
<td>3 As there are no electives in Year 2 of the program, students should complete the university written English requirement in Year 1. If not completed in Year 1, a &quot;W&quot; course must be completed prior to Year 3 in addition to the required Year 2 courses.</td>
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<td>4 MBIO 1010 can be taken in Year 1 after BIOL 1020.</td>
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<td>5 MATH 1010, MATH 1020, the former MATH 1190, the former COMP 1260, the former COMP 1270, COMP 1500 and COMP 1600 may not be chosen to satisfy this requirement.</td>
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<tr>
<td>6 IMPORTANT: Students in the co-operative programs must ensure that they are able to satisfy the prerequisites for all 3000 and 4000 level courses they plan to take.</td>
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<tr>
<td>7 The four-year Major program need not be completed in the manner prescribed in the chart above. The chart indicates one possible arrangement of the required courses and is meant to be a guide around which students can plan their program.</td>
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</table>
STATEMENT OF SUPPORT: PART A – REQUEST FOR ACTION
SCCCC Fall 2020/Spring 2021

Complete Sections A through D of this form. Send a copy, together with Part B and any additional supporting documentation, to unit(s) from which you are seeking a statement of support. The completed form (Sections A through E) is to be submitted to SCCC along with Statements of Support (Part B) received. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes.

SECTION A – UNIT REQUESTING STATEMENT OF SUPPORT
Faculty/College/School: Science
Department or Program: Chemistry (002)

SECTION B – REASON FOR REQUEST FOR SUPPORT
☐ possible curricular overlap or infringement or conflict of jurisdiction with another unit(s)
☒ possible curriculum/course changes in another unit(s) arising from proposed curriculum/course change in your unit
☒ possible impact on demand (increased or decreased) for a specific course(s) in another unit(s)
☐ other (Please elaborate below, in Section C.)

Request for assessment of course intended to satisfy:

☐ Written English ☒ Mathematics ☐ RIC List

Indicate the SCCC deadline your unit will meet:
☐ Fall 2020 ☒ Spring 2021

Indicate date on which request for support – Part A sent to other unit(s):
November 25, 2020

Request that a response be provided by the date indicated:
December 18, 2020

SECTION C – DESCRIPTION OF PROPOSED CURRICULUM/COURSE CHANGE
Briefly describe the proposed curriculum/course change in your unit and outline the request for support. Be as specific as possible, including with respect to the potential impact on courses/curricula in the other unit(s).

The Biochemistry Honours and Major programs are being modified to reflect the recent deletion of MBIO 3030, MBIO 3280, and MBIO 3470, the proposed deletion of MBIO 4670, and the recent introduction of MBIO 3032, MBIO 3282, MBIO 3472, and MBIO 3700.

SECTION D – UNIT(S) RECEIVING REQUEST FOR STATEMENT OF SUPPORT
List the faculties/colleges/schools/departments solicited for a statement of support.

Microbiology; USB

SECTION E – STATEMENT(S) OF SUPPORT RECEIVED
Attach responses received from other units to your faculty/college/school submission to SCCC.
STATEMENT OF SUPPORT: PART B – RESPONSE & ACTION REQUIRED
SCCCC Fall 2020/Spring 2021

Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Science, Faculty of (02)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Science
Department or Program: Microbiology (060)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

The Department of Microbiology support the changes proposed in the biochemistry program since this reflect changes to the Microbiology course offerings.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support.
- Indicate when your unit will submit corresponding changes to the SCCC (e.g., Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

There is no impact to the courses in programs in Microbiology.

SECTION J – SIGNATURES

Department Approval:  Richard Sparling  January 13, 2021
Type Name  Signature  *  Date

Faculty/College/School Approval:

Ben Pak Ching Li  1/13/2021
Type Name  Signature  *  Date

*Signatures are not required for Spring 2021 submissions to SCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the *Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes*. The completed form (Part B) is to be returned to the unit requesting support.

**SECTION F – UNIT REQUESTING SUPPORT**

Faculty/College/School: Science

Department or Program: Science, Faculty of (02)

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**SECTION G – UNIT RESPONDING TO REQUEST**

Faculty/College/School: Université de Saint-Boniface

Department or Program: sciences, Faculte des (USB)

---

**SECTION H – RESPONSE TO REQUEST**

Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

The Université de Saint-Boniface supports the proposed change: deletion of MBIO 3030, MBIO 3280, and MBIO 3470; the proposed deletion of MBIO 4670; and the introduction of MBIO 3032, MBIO 3282, MBIO 3472, and MBIO 3700.

*See next page.*
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- Indicate when your unit will submit corresponding changes to the SCCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCCC deadline indicated on the preceding page, in Section B.

The proposed changes in the Biochemistry Honours and Major programs is expected to have very minimal impact on USB programs.

SECTION I – SIGNATURES

Department Approval: Mathias Oulé

<table>
<thead>
<tr>
<th>Type Name</th>
<th>Signature</th>
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<td>December 17, 2020</td>
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Faculty/College/School Approval:

<table>
<thead>
<tr>
<th>Alexandre Brassard</th>
<th>December 18, 2020</th>
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<tbody>
<tr>
<td>Type Name</td>
<td>Signature*</td>
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<td></td>
<td>Date</td>
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</table>

*Signatures are not required for Spring 2021 submissions to SCCCC.
UNIVERSITY OF MANITOBA

UNDERGRADUATE COURSE MODIFICATION
SCCC Fall 2020/Spring 2021

If the short course title, course number, subject code or number of credit hours is to be changed, do not use this form. The current course MUST be deleted and re-introduced under a new title and/or number and/or different credit hours.

Place the cursor over each form field for instructions. See the Guidelines for Completion of Proposal for Undergraduate/Certificate Course and Curriculum Changes for additional instructions.

SECTION A – COURSE DETAILS

Faculty/College/School: Science

Department or Program: Biological Sciences (071)

Subject code: BIOL  
Course number: 2300

Current Long Title:  
Principles of Ecology

Revised Long Title (maximum 90 characters):

Current Credit Hours: 3

Revised grading mode: Choose one
[Indicate Pass/Fail in revised course description]

Changes Take Effect: Fall 2021

SECTION B – MODIFIED COURSE DESCRIPTION

Provide the course description, exactly as it would appear in the Academic Calendar. See the Guidelines for information on completing this section of the form, including the examples provided there.

BIOL 2300 Principles of Ecology Cr. Hrs. 3

(Lab Required) Principles of ecology at the individual, population, community, and ecosystems levels. This course is the normal prerequisite to other courses in ecology. May not be held with BIOL 2301, BIOL 2390, or AGEC 2370. Prerequisite: BIOL 1030 or BIOL 1031. Prerequisite or concurrent requirement: one of STAT 1150, STAT 1000, STAT 1001, or STAT 2220.

SECTION C – CURRENT COURSE DESCRIPTION

Provide the current course description exactly as it appears in the current Academic Calendar.

BIOL 2300 Principles of Ecology Cr. Hrs. 3

(Lab Required) Principles of ecology at the individual, population, community, and ecosystems levels. This course is the normal prerequisite to other courses in ecology. May not be held with BIOL 2301, BIOL 2390, or AGEC 2370. Prerequisite: BIOL 1030 or BIOL 1031. Prerequisite or concurrent requirement: one of STAT 1150, STAT 1000, or STAT 1001.
SECTION D – RATIONALE
Provide a brief description of the change(s) and a rationale below.

☑  Responds to a recommendation in an external undergraduate program review.

Students in Bioengineering who wish to take BIOL 2300 have previously needed a waiver as their stats requirement, STAT 2220, was not accepted as an alternate PQ/CQ for BIOL 2300. To correct this, the modification herein adds STAT 2220 as an alternate course to meet these requirements.

SECTION E – DETAILS OF PROPOSED MODIFICATION(S)
Adding registration restriction:
Indicate where registration is restricted to students in a faculty/college/school or academic program(s), including level or year of study. List the faculty/college/school and/or programs(s). Indicate registration restrictions in the course description.
Faculty/college/school restrictions:
N/A

Program restrictions (e.g. Honours):
N/A

Adding / Removing Laboratory / Tutorial / Field Trip Requirement: Indicate laboratory / tutorial / field trip requirement in course description.
The course is being modified to:
☐ Add a laboratory ☐ Remove a laboratory
☐ Add a tutorial ☐ Remove a tutorial
☐ Add a field trip requirement ☐ Remove a field trip requirement

Written English and Mathematics Requirements, Recommended Introductory Course List for U1:
The course, as modified:
☐ Satisfies the W requirement and is to be added to the List of Written English Courses.*
☐ Satisfies the M requirement and is to be added to the List of Mathematics Courses.*
☐ Has been accepted for, and is to be added to the RIC List. *
☐ No longer satisfies the W requirement and is to be removed from the List of Written English Courses. *
☐ No longer satisfies the M requirement and is to be removed from the List of Mathematics Courses.*
☐ No longer satisfies and is to be removed from the RIC list. *

*Attach Request for Statement of Support Form(s) and responses received.
SECTION F – RESULTING CHANGES TO COURSES/PROGRAM(S)

See the Guidelines for instructions on how to complete this section of the form. Check all boxes that apply.

This course modification leads to changes to:

☐ other courses in your unit Submit Course Modification Forms for those courses.

☐ programs in your unit Submit Program Modification Forms.

☐ courses in other academic units Requests for Statement of Support Forms are required.

☐ program changes in other academic units Requests for Statement of Support Forms are required.

☑ Other units that use the course will be advised of changes to the course description, including content, prerequisites, corequisites, equivalent and mutually exclusive courses. Requests for Statement of Support Forms are required.

List all courses and/or programs that are affected (e.g. other courses that use the modified course as a prerequisite or corequisite; programs that use the course as a required/elective course), including those in other departments/faculties/colleges/schools. Be as specific as possible.

BIOL 2301; STAT 1000; STAT 115C; STAT 1001; STAT 2220; AGEC 2370; ENTM 4280; SOIL 4400; ENVR 3110; ENVR 3250; BIOL 2390; BIOL 3280; BIOL 3310; BIOL 3312; BIOL 3314; BIOL 3318; BIOL 3350; BIOL 3360; BIOL 3370; BIOL 3372; BIOL 3600; BIOL 4218; BIOL 4220; BIOL 4312; BIOL 4314; BIOL 4330; BIOL 4374; BIOL 4380; BIOL 4400; B.Sc. Agriculture; B.Sc. Agribusiness; B.Sc. Agroecology; B.Sc. in Health Sciences and Health Studies; Bachelor of Environmental Science; Bachelor of Environmental Studies; B.Sc. in Geological Sciences; B.Sc. (Biological Sciences, Microbiology); B.Sc. General, B.Sc. in Engineering (Biosystems).

SECTION G – STATEMENT OF ADDITIONAL COSTS, WORKLOAD, AND/OR SUPPLIES

See the Guidelines for instructions on how to complete this section of the form. Indicate where not applicable.

This change will incur no additional costs.

SECTION H – PREREQUISITE, COREQUISITE, PRE- OR COREQUISITE, & EQUIVALENCY/MUTUAL EXCLUSIVITY

List all prerequisite, corequisite, pre- or corequisite, equivalent, and mutually exclusive courses, including all applicable previous courses numbers (both Aurora and IMS course numbers). See definitions in the Guidelines.

Indicate as a letter grade where a minimum grade for a prerequisite course, examination, or equivalency test is required. A minimum grade of “C” is assumed. A different minimum grade must be stated. Indicate where concurrency is allowed.

Prerequisites: (MUST be taken before)

BIOL 1030, BIOL 1031, or 071.125
Pre- or Corequisites (MUST be taken either before or at the same time)

one of STAT 1150, STAT 1000, 005.100, STAT 1001, STAT 2220, 005.222

Corequisites (MUST be taken at the same time and not be a spanned course)

N/A

Equivalent courses (May NOT be held with existing or former courses with equivalent content, same credit hours, same level. Can be used to meet same program requirements.)

BIOL 2301, AGEC 2370, BOTN 2370, BOTN 2371, ZOOL 2370, ZOOL 2371, 001.237, 022.237, 065.237

Mutually exclusive courses (May NOT be held with existing or former courses with significant content overlap and/or different credit hours and/or different level or the same course previously offered as a topics course. Cannot be held together for credit or used to meet the same program requirement.)

BIOL 2390, BOTN 2280, ZOOL 2290, 001.228, 022.229

SECTION I – SUPPORTING DOCUMENTATION ATTACHED

See the Guidelines for information on required supporting documentation.

☐ Course outline
☐ Library statement
☒ Request for Statement of Support Form(s) and responses received
☐ Program Modification Form(s) – included with faculty/college/school submission to SCCCC

SECTION J – SIGNATURES *

Department Approval:  

Kevin G-E. Scott  

10 November 2020  

Type Name  

Date

Faculty/College/School Approval:

Ben Pak Ching Li  

1/10/2021  

Type Name  

Date

*Signatures are not required for Fall 2020 submissions to SCCCC.
STATEMENT OF SUPPORT: PART A – REQUEST FOR ACTION
SCCCC Fall 2020/Spring 2021

Complete Sections A through D of this form. Send a copy, together with Part B and any additional supporting documentation, to unit(s) from which you are seeking a statement of support. The completed form (Sections A through E) is to be submitted to SCCCC along with Statements of Support (Part B) received. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes.

SECTION A – UNIT REQUESTING STATEMENT OF SUPPORT

Faculty/College/School: Science
Department or Program: Biological Sciences (071)

SECTION B – REASON FOR REQUEST FOR SUPPORT

☐ possible curricular overlap or infringement or conflict of jurisdiction with another unit(s)
☐ possible curriculum/course changes in another unit(s) arising from proposed curriculum/course change in your unit
☐ possible impact on demand (increased or decreased) for a specific course(s) in another unit(s)
☑ other (Please elaborate below, in Section C.)

Request for assessment of course intended to satisfy:

☐ Written English  ☐ Mathematics  ☐ RIC List

Indicate the SCCCC deadline your unit will meet: ☐ Fall 2020  ☑ Spring 2021

Indicate date on which request for support – Part A sent to other unit(s):

Request that a response be provided by the date indicated:

SECTION C – DESCRIPTION OF PROPOSED CURRICULUM/COURSE CHANGE

Briefly describe the proposed curriculum/course change in your unit and outline the request for support. Be as specific as possible, including with respect to the potential impact on courses/curricula in the other unit(s).

The Department of Biological Sciences is adding an alternative course for the STAT prerequisite/corequisite of BIOL 2300. The modification adds STAT 2220 as an alternate PQ/CQ to allow students in Bioengineering who wish to take BIOL 2300 access without a waiver.

This change should have minimal impact on students in your program.

SECTION D – UNIT(S) RECEIVING REQUEST FOR STATEMENT OF SUPPORT

List the faculties/colleges/schools/departments solicited for a statement of support.

Bioengineering, USB, Health Sciences, Entomology, Environment, Agriculture, Science, Microbiology, Statistics, Geological Sciences, Soil Science, Agribuisness

SECTION E – STATEMENT(S) OF SUPPORT RECEIVED

Attach responses received from other units to your faculty/college/school submission to SCCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Biological Sciences (071)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Choose one
Department or Program: Choose one

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCCC should be aware of.

There will be no impact to our unit. We are in support of this curriculum change.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support.
- **Indicate when your unit will submit corresponding changes to the SCCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCCC deadline indicated on the preceding page, in Section B.**

No impact, as a minimum C grade is required in our program.

SECTION J – SIGNATURES*

Department Approval: Nazim Cicek 
Type Name 
Date Jan 18, 2021

Faculty/College/School Approval:

Type Name 
Date

*Signatures are not required for Fall 2020 submissions to SCCCC.
STATEMENT OF SUPPORT: PART B – RESPONSE & ACTION REQUIRED
SCCCC Fall 2020/Spring 2021

Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Biological Sciences (071)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Université de Saint-Boniface
Department or Program: sciences, Faculte des (USB)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCCC should be aware of.

There is minimal impact for the Université de Saint-Boniface.

The Université de Saint-Boniface supports adding STAT 2220 as an option prerequisite/Co-requisite for BIOL 2300.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- Indicate when your unit will submit corresponding changes to the SCCCC, (e.g. Fall 2020 or Spring 2021), *in most cases, this will be the SCCCC deadline indicated on the preceding page, in Section B.*

We will adding STAT 2220 as a option prerequisite for BIOL 2301.
Changes will be presented to the Fall 2021 SCCCC.

SECTION J – SIGNATURES*

Department Approval:  Mathias Oulé 18 janvier 2021
Type Name Date

Faculty/College/School Approval:

Alexandre Brassard 18 janvier 2021
Type Name Date

*Signatures are not required for Fall 2020 submissions to SCCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Biological Sciences (071)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Health Sciences
Department or Program: Interdisciplinary Health Program

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCCC should be aware of.

BIOL 2300 is an elective for Bachelor of Health Sciences students. The proposed change will not impact any courses in our curriculum. The IHP supports these changes as having higher grades in STAT courses as a requirement will enhance student success in BIOL 2300.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- **Indicate when your unit will submit corresponding changes to the SCCCC, e.g. Fall 2020 or Spring 2021. In most cases, this will be the SCCCC deadline indicated on the preceding page, in Section B.**

No impact identified. No changes are required for submission to SCCCC.

SECTION J – SIGNATURES*

Department Approval:  Mark Nachtigal  January 18, 2021
Type Name  Date

Faculty/College/School Approval:
Marie Edwards  January 18, 2021
Type Name  Date

*Signatures are not required for Fall 2020 submissions to SCCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Biological Sciences (071)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Agricultural and Food Sciences
Department or Program: Entomology (038)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

This changes impacts ENTM 4280 Aquatic Entomology. The course prerequisites include AGEC 2370 or BIOL 2300. Students from our Faculty no longer take STAT courses but will still have access to take AGEC 2370.

The Department of Entomology is supportive of this request. We were aware less of our students would be able to take BIOL 2300 when the Faculty removed STAT 1000 from our program’s required courses. However, if the Department of Biological Sciences is willing to consider adding AGRI 2400 Experimental Methods in Agricultural and Food Science (M designation) to the options of STAT co-req it would open the course up to our FAFS students.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- **Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.**

No submission is required to SCCC for this support.

SECTION J – SIGNATURES*

Department Approval: Robert Currie

Type Name

November 13, 2020

Date

Faculty/College/School Approval:

Jitendra Paliwal

Type Name

Nov. 19, 2020

Date

*Signatures are not required for Fall 2020 submissions to SCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the *Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes*. The completed form (Part B) is to be returned to the unit requesting support.

**SECTION F – UNIT REQUESTING SUPPORT**

Faculty/College/School: Science  
Department or Program: Biological Sciences (071)

**SECTION G – UNIT RESPONDING TO REQUEST**

Faculty/College/School: Environment, Earth, and Resources  
Department or Program: Environment and Geography (128)

**SECTION H – RESPONSE TO REQUEST**

Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCCC should be aware of.

There will be no impact on our courses or curricula. We have no concerns and support the changes.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

There will be no impact on our courses or curricula.

SECTION J – SIGNATURES*

Department Approval:  Mark Hanson  November 12th 2020
Type Name  Date

Faculty/College/School Approval:

Stephan Pflugmacher Lima  November 13th 2020
Type Name  Date

*Signatures are not required for Fall 2020 submissions to SCCC.
STATEMENT OF SUPPORT: PART B – RESPONSE & ACTION REQUIRED
SCCCC Fall 2020/Spring 2021

Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Biological Sciences (071)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Agricultural and Food Sciences
Department or Program: Agriculture, General (065)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCCC should be aware of.

Students in our FAFS programs can take either AGEC 2370 or BIOL 2300 (equivalent courses). Our students that do not take STAT courses will still have access to AGEC 2370.

The Faculty of Agricultural and Food Sciences is supportive of this request. We were aware less of our students would be able to take BIOL 2300 when we removed STAT 1000 from our program’s required courses. However, if the Department of Biological Sciences is willing to consider adding AGRI 2400 Experimental Methods in Agricultural and Food Science (M designation) to the options of STAT co-reqs it would open the course up to our FAFS students.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

No submission is required to SCCC for this support.

SECTION J – SIGNATURES*

Department Approval:  jitendra Paliwal

Type Name

November 13, 2020

Date

Faculty/College/School Approval:

Martín Scanlon

Type Name

November 20, 2020

Date

*Signatures are not required for Fall 2020 submissions to SCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Biological Sciences (071)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Science
Department or Program: Choose one

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

no impact. The B.Sc. General program supports this.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support.
- *Indicate when your unit will submit corresponding changes to the SCCCC, (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCCC deadline indicated on the preceding page, in Section B.*

SECTION J – SIGNATURES*

Department Approval: _____________________________________________________________________________
Type Name                                      Date

Faculty/College/School Approval:

Ben Pak Ching Li                                  1/18/2021
Type Name                                      Date

*Signatures are not required for Fall 2020 submissions to SCCCC.*
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F — UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Biological Sciences (071)

SECTION G — UNIT RESPONDING TO REQUEST
Faculty/College/School: Science
Department or Program: Microbiology (060)

SECTION H — RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

The department of Microbiology supports the addition of STAT 2220 as an alternate pre/co-requisite to BIOL 2300.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

The addition of this alternate pre/co-requisite to BIOL 2300 will have no impact on the students in the Microbiology programs.

SECTION J – SIGNATURES*

Department Approval:  Richard Sparling  12th of November 2020
Type Name  Date

Faculty/College/School Approval:

Ben Pak Ching Li  1/10/2021
Type Name  Date

*Signatures are not required for Fall 2020 submissions to SCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F - UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Biological Sciences (071)

SECTION G - UNIT RESPONDING TO REQUEST
Faculty/College/School: Science
Department or Program: Statistics (005)

SECTION H - RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

The Department of Statistics has no concerns at this time and supports this request which is expected to have minimal impact on our course offerings and enrollments.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- Indicate when your unit will submit corresponding changes to the SCCCC (e.g. Fall 2020 or Spring 2021). *In most cases, this will be the SCCCC deadline indicated on the preceding page, in Section B.*

No actions are required from the Department of Statistics as a result of this request.

SECTION J – SIGNATURES*

Department Approval:  Alexandre Leblanc  
Type Name  
November 19, 2020  
Date

Faculty/College/School Approval:

Ben Pak Ching Li  
Type Name  
11/23/2020  
Date

*Signatures are not required for Fall 2020 submissions to SCCCC.*
Section F is to be completed by the unit requesting a statement of support. Sections G through J a’re to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Biological Sciences (071)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Agricultural and Food Sciences
Department or Program: Soil Science (040)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCCC should be aware of.

Students in our FAFS programs can take either AGEC 2370 or BIOL 2300 (equivalent courses). Our students that do not take STAT courses will still have access to AGEC 2370.

The Department of Soil Science is supportive of this request. We were aware less of our students would be able to take BIOL 2300 when we removed STAT 1000 from our program’s required courses. However, if the Department of Biological Sciences is willing to consider adding AGRI 2400 Experimental Methods in Agricultural and Food Science (M designation) to the options of STAT co-reqs it would open the course up to our FAFS students.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- Indicate when your unit will submit corresponding changes to the SCCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCCC deadline indicated on the preceding page, in Section B.

No submission is required to SCCCC for this support.

SECTION J – SIGNATURES*

Department Approval: Francis Zvomuya

Type Name

November 13, 2020

Date

Faculty/College/School Approval:

Jitendra Paliwal

Type Name

Nov. 19, 2020

Date

*Signatures are not required for Fall 2020 submissions to SCCCC.
STATEMENT OF SUPPORT: PART B – RESPONSE & ACTION REQUIRED
SCCCC Fall 2020/Spring 2021

Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT

Faculty/College/School: Science
Department or Program: Biological Sciences (071)

SECTION G – UNIT RESPONDING TO REQUEST

Faculty/College/School: Agricultural and Food Sciences
Department or Program: Agribusiness and Agroeconomics (061)

SECTION H – RESPONSE TO REQUEST

Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

Students in the Agribusiness program can take either AGEC 2370 or BIOL 2300 (equivalent courses). Our students that do not take STAT courses will still have access to AGEC 2370.

The Department of Agribusiness and Agroeconomics and the Agribusiness program are supportive of this request. We were aware less of our students would be able to take BIOL 2300 when we removed STAT 1000 from our program’s required courses. However, if the Department of Biological Sciences is willing to consider adding AGRI 2400 Experimental Methods in Agricultural and Food Science (M designation) to the options of STAT co-reqs it would open the course up to our FAFS students.

See next page.
SECTION I - IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support.
- Indicate when your unit will submit corresponding changes to the SCCC (e.g., Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

No submission is required to SCCC for this support.

SECTION J – SIGNATURES*

Department Approval:  Derek Brewin  November 13, 2020
Type Name  Date

Faculty-College/School Approval:

Jitendra Paliwal  November 19, 2020
Type Name  Date

*Signatures are not required for Fall 2020 submissions to SCCC.
If the short course title, course number, subject code or number of credit hours is to be changed, do not use this form. The current course MUST be deleted and re-introduced under a new title and/or number and/or different credit hours.

Place the cursor over each form field for instructions. See the Guidelines for Completion of Proposal for Undergraduate/Certificate Course and Curriculum Changes for additional instructions.

SECTION A – COURSE DETAILS
Faculty/College/School: Science
Department or Program: Biological Sciences (071)
Subject code: BIOL Course number: 4216
Current Long Title: Biology of Birds
Revised Long Title (maximum 90 characters):

Current Credit Hours: 3 Revised grading mode: Choose one

Changes Take Effect: Fall 2021

[Indicate Pass/Fail in revised course description]

SECTION B – MODIFIED COURSE DESCRIPTION
Provide the course description, exactly as it would appear in the Academic Calendar. See the Guidelines for information on completing this section of the form, including the examples provided there.

BIOL 4216 Biology of Birds Cr. Hrs. 3
(Lab Required) Biology of birds including: morphology, systematics, evolution, life histories and breeding biology, ecology, migration, and distribution of birds. Prerequisite: BIOL 2210 or BIOL 2231.

SECTION C – CURRENT COURSE DESCRIPTION
Provide the current course description exactly as it appears in the current Academic Calendar.

BIOL 4216 Biology of Birds Cr. Hrs. 3
(Lab Required) Biology of birds including: morphology, systematics, evolution, life histories and breeding biology, ecology, migration, and distribution of birds. Prerequisite: BIOL 2210 (C) or BIOL 2231 (C). Prerequisite or concurrent requirement: BIOL 3360.
SECTION D – RATIONALE
Provide a brief description of the change(s) and a rationale below.

☐ Responds to a recommendation in an external undergraduate program review.

The concepts taught in BIOL 3360 are not critical for the successful completion of BIOL 4216. The proposed change is to remove BIOL 3360 as a PQ/CQ.

SECTION E – DETAILS OF PROPOSED MODIFICATION(S)
Adding registration restriction:

Indicate where registration is restricted to students in a faculty/college/school or academic program(s), including level or year of study. List the faculty/college/school and/or programs(s). Indicate registration restrictions in the course description.

Faculty/college/school restrictions:
N/A

Program restrictions (e.g. Honours):
N/A

Adding / Removing Laboratory / Tutorial / Field Trip Requirement: Indicate laboratory / tutorial / field trip requirement in course description.

The course is being modified to:

☐ Add a laboratory
☐ Add a tutorial
☐ Add a field trip requirement
☐ Remove a laboratory
☐ Remove a tutorial
☐ Remove a field trip requirement

Written English and Mathematics Requirements, Recommended Introductory Course List for U1:
The course, as modified:

☐ Satisfies the W requirement and is to be added to the List of Written English Courses.*
☐ Satisfies the M requirement and is to be added to the List of Mathematics Courses.*
☐ Has been accepted for, and is to be added to the RIC List. *

☐ No longer satisfies the W requirement and is to be removed from the List of Written English Courses. *
☐ No longer satisfies the M requirement and is to be removed from the List of Mathematics Courses.*
☐ No longer satisfies and is to be removed from the RIC list. *

*Attach Request for Statement of Support Form(s) and responses received.
SECTION F – RESULTING CHANGES TO COURSES/PROGRAM(S)

See the Guidelines for instructions on how to complete this section of the form. Check all boxes that apply.

This course modification leads to changes to:

☐ other courses in your unit Submit Course Modification Forms for those courses.

☐ programs in your unit Submit Program Modification Forms.

☐ courses in other academic units Requests for Statement of Support Forms are required.

☐ program changes in other academic units Requests for Statement of Support Forms are required.

☐ Other units that use the course will be advised of changes to the course description, including content, prerequisites, corequisites, equivalent and mutually exclusive courses. Requests for Statement of Support Forms are required.

List all courses and/or programs that are affected (e.g. other courses that use the modified course as a prerequisite or corequisite; programs that use the course as a required/elective course), including those in other departments/faculties/colleges/schools. Be as specific as possible.

This change should not affect any other unit.

SECTION G – STATEMENT OF ADDITIONAL COSTS, WORKLOAD, AND/OR SUPPLIES

See the Guidelines for instructions on how to complete this section of the form. Indicate where not applicable.

This change is not expected to incur any additional costs.

SECTION H – PREREQUISITE, COREQUISITE, PRE- OR COREQUISITE, & EQUIVALENCY/MUTUAL EXCLUSIVITY

List all prerequisite, corequisite, pre- or corequisite, equivalent, and mutually exclusive courses, including all applicable previous courses numbers (both Aurora and IMS course numbers). See definitions in the Guidelines.

Indicate as a letter grade where a minimum grade for a prerequisite course, examination, or equivalency test is required. A minimum grade of "C" is assumed. A different minimum grade must be stated. Indicate where concurrency is allowed.

Prerequisites: (MUST be taken before)

one of BIOL 2210, BIOL 2231, ZOOL 2320, ZOOL 2501, 022.232, 022.250
Pre- or Corequisites (MUST be taken either before or at the same time)
N/A

Corequisites (MUST be taken at the same time and not be a spanned course)
N/A

Equivalent courses (May NOT be held with existing or former courses with equivalent content, same credit hours, same level. Can be used to meet same program requirements.)
ZOOL 4240, 022.424

Mutually exclusive courses (May NOT be held with existing or former courses with significant content overlap and/or different credit hours and/or different level or the same course previously offered as a topics course. Cannot be held together for credit or used to meet the same program requirement.)
022.468

SECTION I – SUPPORTING DOCUMENTATION ATTACHED
See the Guidelines for information on required supporting documentation.
☐ Course outline
☐ Library statement
☐ Request for Statement of Support Form(s) and responses received
☐ Program Modification Form(s) – included with faculty/college/school submission to SCCC

SECTION J – SIGNATURES*

Department Approval:  Kevin G-E. Scott  10 November 2020
Type Name  Date

Faculty/College/School Approval:
Ben Pak Ching Li  1/10/2021
Type Name  Date

*Signatures are not required for Fall 2020 submissions to SCCC.
SECTION A
Faculty/College/School: Science
Department or Program: Biological Sciences (071)
Program (i.e. credential and discipline): B.Sc. General - Biological Sciences
Changes Take Effect: Fall 2021

SECTION B – DESCRIPTION OF PROGRAM MODIFICATION
Provide a brief description of the proposed program modification. Limit – 200 words.

The Department of Biological Sciences is proposing to make modifications to its calendar description to remove mention of the requirements for the 3-year general science degree, and the optional Biological Sciences focus in the 3-year general science degree. This change is to align with the changes that the Faculty of Science is making to its general degree program. Our department is in favour of the proposed changes if students entering the Faculty are encouraged to declare a 4-year program.

SECTION C – RATIONALE
☐ Responds to a recommendation in an external undergraduate program review.

Provide a brief rationale for the program modification in the space provided.

With the proposed change to the advanced level Science requirements in the B.Sc. general degree, and the removal of the Biology focus option in the 3-year general degree, they should no longer be listed in our program description.

SECTION D – ACADEMIC CALENDAR CONTENT
Attach a revised program description, including program charts and any other Academic Calendar content that would require updates to reflect course and curriculum changes. Beginning with the program description as it appears in the current Academic Calendar, clearly indicate proposed changes using strikethrough font (e.g. strikethrough) to indicate content that is to be deleted and bold font to indicate content that is to be added.
SECTION E – STATEMENT OF ADDITIONAL COSTS, WORKLOAD, AND/OR SUPPLIES

See the Guidelines for instructions on how to complete this section of the form. Indicate where not applicable.

This change is more likely to reduce the pressure on our oversubscribed second-year courses than cause an increased costs or workload. If we do see an increase in Biology majors/honours students, it will likely be offset by a reduction in General Science students.

SECTION F – CONSULTATION WITH OTHER UNITS THAT MIGHT BE AFFECTED BY CHANGES

See the Guidelines for instructions on how to complete this section of the form.

☐ This program modification leads to changes in programs in other units. Requests for Statement of Support Forms are required.

In the space provided, list all programs that are affected, including those in other departments, faculties, colleges, or schools. Be as specific as possible.

SECTION G – SUPPORTING DOCUMENTATION ATTACHED

See the Guidelines for information on required supporting documentation.

☐ Executive summary (required only for significant program modifications)

☐ Transition plan (required for significant program modifications)

☐ Current and revised Academic Calendar content, including program descriptions and charts (required)

☐ SPPC Program Proposal Budget Form

☐ Request for Statement of Support Forms and responses received

SECTION H – SIGNATURES *

Department Approval:

Kevin G-E Scott 16 July 2020

Type Name Date

Faculty/College/School Approval:

Ben Pak Ching Li 1/10/2021

Type Name Date

*Signatures are not required for Fall 2020 submissions to SCCCC.
Current content based on changes approved by 4Cs and Senate in Fall 2020

4.3.6 B.Sc.-General-Degree-Biological-Sciences

Courses taken as part of a General degree program provide an introduction to the major fields of study in the Biological Sciences. Students have two options for the General Degree under the Department of Biological Sciences:

- **Option A**: 18 credit hours of 2000, 3000, and (or) 4000 level Biological Sciences courses (subject to the Faculty requirement that of the 36 credit hours in the two chosen advanced level Science areas, at least 6 credit hours must be at the 3000/4000 level);

- **Option B**: Students may choose 36 credit hours from the Biological Sciences provided they select the following courses: each of BIOL 2300; BIOL 2500, BIOL 2520; two one of BIOL 2200, or BIOL 2210; one of BIOL 2240, BIOL 2242, BIOL 2260, or BIOL 2262, or BIOL 2420; plus 21 additional credit hours (2000 level or higher) from the Biological Sciences including at least a minimum of 6 credit hours at the 3000 or 4000 level.

Students anticipating a transfer to either the four-year Major or Honours program at the end of their second or third year should consult with the Departmental Program Advisor before registering.

**NOTE:**

- BIOL 2300 has a prerequisite or concurrent requirement of STAT 1150 or STAT 1000. Students planning this option should consider taking STAT 1150 or STAT 1000 as part of their Introductory Science requirement.

### 4.3.7.6 Biological Sciences – Minor Requirements Program Charts

<table>
<thead>
<tr>
<th>YEAR 1</th>
<th>YEAR 2</th>
<th>YEAR 3</th>
<th>YEAR 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>THREE-YEAR-GENERAL 90 CREDIT HOURS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 1020, BIOL 1030</td>
<td>18 credit hours of 2000, 3000, and (or) 4000 level Biological Sciences courses (subject to the Faculty requirement that of the 36 credit hours in the two chosen advanced level Science areas, at least 6 credit hours must be at the 3000/4000 level); or Students may choose all 36 credit hours of advanced level courses from the Department of Biological Sciences as long as courses are selected following the provisions outlined below: Each of BIOL 2300, BIOL 2500, BIOL 2520; two one of BIOL 2200, or BIOL 2210; one of BIOL 2240, BIOL 2242, BIOL 2260, or BIOL 2262, or BIOL 2420; plus 21 additional credit hours from the Biological Sciences including at least 6 credit hours at the 3000 or 4000 level.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MINOR</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 1020, BIOL 1030</td>
<td>12 credit hours of 2000, 3000, and/or 4000 level Biology courses.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTES:**

- BIOL 2300 has STAT 1150 or STAT 1000 as a prerequisite or concurrent requirement. Students in this program may want to consider selecting STAT 1150 or STAT 1000 as part of their Introductory Science requirement. See Section 3.2 for more information.
SECTION A
Faculty/College/School: Science
Department or Program: Choose one
Program (i.e. credential and discipline): B.Sc. Honours and Major in Biotechnology
Changes Take Effect: Fall 2021

SECTION B – DESCRIPTION OF PROGRAM MODIFICATION
Provide a brief description of the proposed program modification. Limit – 200 words.
The departments of Chemistry and Microbiology are proposing modifications to the B.Sc. Honours and Major program in response to upcoming changes in course offerings in the two departments. Note: As of Fall 2018, admission to the Biotechnology programs has been temporarily suspended.

SECTION C – RATIONALE
☐ Responds to a recommendation in an external undergraduate program review.
Provide a brief rationale for the program modification in the space provided.
The proposed program modifications are in response to upcoming changes in the course offerings in the departments of Chemistry and Microbiology.

SECTION D – ACADEMIC CALENDAR CONTENT
Attach a revised program description, including program charts and any other Academic Calendar content that would require updates to reflect course and curriculum changes. Beginning with the program description as it appears in the current Academic Calendar, clearly indicate proposed changes using strikethrough font (e.g. strikethrough) to indicate content that is to be deleted and bold font to indicate content that is to be added.
SECTION E – STATEMENT OF ADDITIONAL COSTS, WORKLOAD, AND/OR SUPPLIES
See the Guidelines for instructions on how to complete this section of the form. Indicate where not applicable.

n/a

SECTION F – CONSULTATION WITH OTHER UNITS THAT MIGHT BE AFFECTED BY CHANGES
See the Guidelines for instructions on how to complete this section of the form.

☑ This program modification leads to changes in programs in other units. Requests for Statement of Support Forms are required.

In the space provided, list all programs that are affected, including those in other departments, faculties, colleges, or schools. Be as specific as possible.

Biological Sciences, Faculty of Science Co-op, Management, Animal Systems, Food Science, Plant Biotechnology, Human Nutrition and Metabolism

SECTION G – SUPPORTING DOCUMENTATION ATTACHED
See the Guidelines for information on required supporting documentation. Attach documents in the following order.

☐ Executive summary (required only for significant program modifications)
☑ Transition plan (required for significant program modifications)
☑ Current and revised Academic Calendar content, including program descriptions and charts (required)
☐ SPPC Program Proposal Budget Form
☑ Request for Statement of Support Forms and responses received

SECTION H – SIGNATURES

Department Approval: Joe O’Neil

<table>
<thead>
<tr>
<th>Type Name</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joe O’Neil</td>
<td>Signature *</td>
<td>January 18, 2021</td>
</tr>
</tbody>
</table>

Digitally signed by Joe O’Neil
Date: 2021.01.18 09:50:49 -06'00"

Faculty/College/School Approval:

Richard Sparling

<table>
<thead>
<tr>
<th>Type Name</th>
<th>Signature *</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Richard Sparling</td>
<td>Signature numérica de Richard Sparling</td>
<td>18 January 2021</td>
</tr>
</tbody>
</table>

Signature numérique de Richard Sparling
Date : 2021.01.18 10:10:35 -06'00"

*Signatures are not required for Spring 2021 submissions to SCCCC.
Biotechnology Transition Plan

The expectation is that after the February 2021 graduation there will be 1 or 2 students remaining in the Biotechnology programs.

With these proposed revisions, the departments of Chemistry and Microbiology, and the Faculty of Science Dean’s Office will work with the student(s) to identify their route to degree completion.
4.4.1 Program Information

NOTE: As of Fall 2018, admission to the Biotechnology programs has been temporarily suspended. For further information, see the Faculty of Science office.

Biotechnology Honours Degree Requirements

To enter the Biotechnology Joint Honours program, a student must have completed at least 24 credit hours with a minimum DGPA of 3.00, and also obtained a minimum grade of “B” in CHEM 1110 and 1310 and a minimum grade of “C+” in CHEM 1120 and BIOL 1020. CHEM 1100, BIOL 1030, MATH 1500, PHYS 1020 (or PHYS 1050), and STAT 1000 are required courses in the program and students are strongly encouraged to complete these courses in first year. Six credit hours of Arts electives, including the written English course should also be taken in Year 1.

Students will select one stream (Analytical or Molecular Biotechnology). Students are also encouraged to select a Minor in a complementary area. There are enough free electives to cover the 18 credit hours required for a Minor. All students must complete a Common Core of required courses plus required Stream Specific courses. The remaining courses can be selected from the list of Recommended Electives. This list is meant to give students some idea of appropriate electives; however, students have the option to choose courses not on the list in consultation with the Program Advisors.

To continue in the Biotechnology Joint Honours program, students must maintain a minimum DGPA of 3.00 and complete a minimum of 9 credit hours during each Fall and Winter Term. No more than 15 credit hours of F grades may be accumulated, regardless of whether any course has been repeated and a higher grade achieved. Research Project in Biotechnology (BTEC 4000) must be taken in the final year of the program.

To graduate from the Biotechnology Joint Honours program, students must achieve a minimum DGPA of 3.00 and obtain a minimum grade of “C” on the courses that contribute to the 120 credit hours that make up the degree.

Students who do not meet these minimum requirements will be required to withdraw from the program and may be eligible to enter the 4-Year Major degree program in Biotechnology. Depending on course selection, students may also be eligible to enter other Major Programs (e.g., Biochemistry, Biological Sciences, Chemistry, or Microbiology) and/or the 3-year B.Sc. General Degree program.

Biotechnology Honours Cooperative Option

Students interested in alternating academic terms and terms of paid employment as part of their Honours Biotechnology program may enter the Cooperative Option in April of their second year in Honours Biotechnology. This program provides students with a minimum of 12 months of paid employment by the time they graduate. It enables them to obtain work experience in research and industry with participating firms, government agencies and university units.

The course and grade requirements for entry to this option are the same as those required for entry to the regular Honours program, as indicated in the chart. Students are required to complete the first and second year requirements of the program, and MBIO 3410 before they begin their first employment term. Students should refer to the general faculty regulations for B.Sc. (Honours) Cooperative Options in Section 3.6.

To continue in the Honours Cooperative program, a student must maintain a minimum DGPA of 3.00, successfully complete each work term, and complete a minimum of 9 credit hours during each academic term. Students should note that the grade requirements for the Cooperative Option are the same as that for the regular Honours program (see above).

Students must check with the Co-op office for the April application deadline information. They will normally be notified of their provisional acceptance in the program by September. Acceptance into the program is dependent upon the student receiving an employment placement. Employment term positions available to the students will be approved by the department, and the employers will select the students they wish to employ. Students are advised that
satisfying the entrance requirements does not guarantee a place in the Cooperative Option if the demand for places exceeds the number of places available. The department reserves the right to determine and select the best qualified applicants.

Students are required to register in and pay fees for each employment term prior to the commencement of each employment term. Students will be required to submit an employment report upon the completion of each employment term.

Biotechnology 4-Year Major Degree Requirements

To enter the Biotechnology Joint Major program a student must have completed at least 24 credit hours with a minimum DGPA of 2.00 and also obtained a minimum grade of “C+” in CHEM 1110 and 1310 and a minimum grade of “C” in CHEM 1120 and BIOL 1020, BIOL 1030, CHEM 1100, MATH 1500, PHYS 1020 or 1050, and STAT 1000 are required courses in the program and students are strongly urged to complete these courses in first year. Six credit hours of Arts electives, including the written English course should also be taken in Year 1.

Biotechnology students will select one stream (Analytical or Molecular Biotechnology). Students are also encouraged to select a Minor in a complementary area. There are enough free electives to cover the 18 credit hours required for a Minor. All students must complete a Common Core of required courses plus required Stream Specific courses. The remaining courses can be selected from the list of Recommended Electives. This list is meant to give students some idea of appropriate electives; however, students have the option to choose courses not on the list in consultation with the Program Advisors.

To continue in the Major program a student must maintain a minimum DGPA of 2.00. No more than 18 credit hours of F grades can be accumulated regardless of whether any course has been repeated and a higher grade achieved.

To graduate from the Biotechnology Joint Major degree, students must maintain a minimum DGPA of 2.00. Students must also obtain a minimum grade of “C” on all Common Core and stream specific courses outlined below. There is no term registration load requirement in the Major degree.

Students who do not meet these minimum requirements will be required to withdraw from the program and will normally be eligible to enter the 3-Year B.Sc. General degree program.

Biotechnology 4 Year Major Cooperative Option

Students interested in alternating academic terms and terms of paid employment as part of their Major program in Biotechnology may enter the Cooperative Option in April of their second year in Biotechnology. This program provides students with a minimum of 12 months of paid employment by the time they graduate. It enables them to obtain work experience in research and industry with participating firms, government agencies and university units.

The course and grade requirements for entry to this option are the same as those required for entry to the regular Major program. MBIO 3410 is required in Year 3. Students are required to complete the first and second year requirements of the program and MBIO 3410 before they begin their first employment term. Students should refer to the general faculty regulations for B.Sc. (Major) Cooperative Options in Section 3.4.

Students must check with the Co-op office for the April application deadline information. They will normally be notified of their provisional acceptance in the program by September. Acceptance into the program is dependent upon the student receiving an employment placement. Employment term positions available to the students will be approved by the department, and the employers will select the students they wish to employ. Students are advised that satisfying the entrance requirements does not guarantee a place in the Cooperative Option if the demand for places exceeds the number of places available. The department reserves the right to determine and select the best qualified applicants.

Students are required to register in and pay fees for each employment term prior to the commencement of each employment term. Students will be required to submit an employment report upon the completion of each employment term.

Honours and Major Co-operative Options
A co-operative education option is available for both Major and Honours students. Students should refer to Section 3.5 of this chapter for further information on the Co-op programs.

Honours Co-op

The course, grade requirements and minimum DGPA requirement for entry and continuation in the Co-operative Option are the same as that for regular Honours program.

Students are required to complete the first and second year requirements of the program and MBIO 3410 before beginning their first co-op work term.

Major Co-op

The course and minimum grade requirements for entry and continuation in the Co-operative Option are the same as those required for the regular Major program. However, the entry and continuation DGPA requirement is set at a minimum of 2.5.

Students are required to complete the first and second year requirements of the program and MBIO 3410 before beginning their first co-op work term.

Common Core Courses:

BIOL 2500, BIOL 2520, CHEM 2210, CHEM 2220, CHEM 2100, CHEM 2110, CHEM 2122, CHEM/MBIO 2360, CHEM/MBIO 2370, CHEM/MBIO 2700, CHEM/MBIO 2710, CHEM 2720, CHEM 2470, CHEM 2510, CHEM 2520 (2), CHEM 3590, CHEM 3500, CHEM 3760 (4), CHEM 4630, MBIO 1010, MBIO 2020, MBIO 3000, MBIO 3030, MBIO 3032, MBIO 3410, MBIO 3700, MBIO 4520

Optional Courses:

Appropriate prerequisites must be taken for all Optional courses.

CHEM 3570, CHEM 3520, CHEM 3700, CHEM 4360, CHEM 4670, MBIO 3430, MBIO 4040, MBIO 4020, MBIO 4610, MBIO 4410, MBIO 4440, BIOL 3300, BIOL 4554/4556, BIOL 4540, BIOL 4560, PLNT 2530, PLNT 4610, COMP 3820

Program Stream Courses:

Analytical Biotechnology: MATH 1700, CHEM 4370, CHEM 4590, CHEM 4670, CHEM 4700

Molecular Biotechnology: BIOL 4544 or BIOL 4556, MBIO 4600, MBIO 3600, MBIO 4602, MBIO 4610, MBIO 4612, MBIO 4672

Note: In some instances pre-requisites will be waived upon approval by the appropriate department.

Complementary Existing Minors that could satisfy the Recommended Electives (Minors require 18 cr hrs of prescribed courses):

Management, Animal Systems, Food Science, Plant Biotechnology, or Human Nutrition and Metabolism

Recommended General Electives if not required in Program stream:

All courses in above described Minors.

Appropriate pre-requisites must also be taken for all Electives.
4.4.2 Biotechnology Programs (incl. Co-operative Option if selected)

NOTE: As of Fall 2018, admission to the Biotechnology programs has been temporarily suspended. For further information, see the Faculty of Science office.

The requirements listed below can be completed in Year 1 or Year 2:

6 credit hours from the Faculty of Arts including the required “W” course

6 credit hours of Required Program Stream courses or electives

The requirements listed below can be completed in 3rd or 4th year:

The requirements listed below can be completed in 3rd or 4th year:

9 credit hours of Optional Courses

27 15 credit hours of Required Program Stream courses and electives

3 credit hours of electives

Work Terms (if Co-op Selected):

Work Terms (if Co-op Selected):
<table>
<thead>
<tr>
<th>JOINT FOUR YEAR MAJOR (incl. Co-operative Option if selected)</th>
<th>120 CREDIT HOURS</th>
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<tr>
<td><strong>BIOL 1020, BIOL 1030</strong></td>
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<td><strong>MBIO 3000, MBIO 3030, MBIO 3032, MBIO 3410, MBIO 3700</strong></td>
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The requirements listed below can be completed in Year 1 or Year 2:

6 credit hours from the Faculty of Arts including the required “W” course

6 credit hours of Required Program Stream courses and/or approved electives

The requirements listed below can be completed during 3rd and 4th year:

**CHEM 3760 (4)**

9 credit hours of Optional Courses

33 15 credit hours of Required Program Stream courses and electives

9 credit hours of electives

Work Terms (if Co-op Selected):

BTEC 3980, BTEC 3990

SCI 3980, SCI 3990

Work Terms (if Co-op Selected):

BTEC 4980 and/or BTEC 4990

SCI 4980, and SCI 4990 (if a 4th work term is selected)

NOTES:
1 MATH 1230, MATH 1510 or MATH 1520 may be used in place of MATH 1500; MATH 1232 or MATH 1710 may be used in place of MATH 1700.

2 BTEC 4000 is required for students in the Honours program only. Students in the Honours Co-operative program will require 6 credit hours of approved electives.

3 Optional courses and program stream courses requirements can be found above the Biotechnology program charts in section 4.4.1.

4 Refer to list of recommended elective courses and complementary Minor programs (listed above charts) prior to registration in your electives.

4 BTEC 4000 is required for students in the Honours program only. Students in the Honours Co-operative program will require 6 credit hours of approved electives.

4 Choice of BIOL 4554 or BIOL 4556 not already chosen for stream.

(The number 6 in brackets indicates a 6 credit hour course.)

(The numbers 2, 4, and 6 in brackets indicate two, four and six credit-hour courses, respectively. All other courses are 3 credit hours.)
STATEMENT OF SUPPORT: PART A – REQUEST FOR ACTION
SCCCC Fall 2020/Spring 2021

Complete Sections A through D of this form. Send a copy, together with Part B and any additional supporting documentation, to unit(s) from which you are seeking a statement of support. The completed form (Sections A through E) is to be submitted to SCCCC along with Statements of Support (Part B) received. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes.

SECTION A – UNIT REQUESTING STATEMENT OF SUPPORT
Faculty/College/School: Science
Department or Program: Choose one

SECTION B – REASON FOR REQUEST FOR SUPPORT
☐ possible curricular overlap or infringement or conflict of jurisdiction with another unit(s)
☐ possible curriculum/course changes in another unit(s) arising from proposed curriculum/course change in your unit
☑ possible impact on demand (increased or decreased) for a specific course(s) in another unit(s)
☐ other (Please elaborate below, in Section C.)

Request for assessment of course intended to satisfy:
☐ Written English ☐ Mathematics ☐ RIC List

Indicate the SCCCC deadline your unit will meet: ☑ Fall 2020 ☑ Spring 2021

Indicate date on which request for support – Part A sent to other unit(s): January 19, 2021
Request that a response be provided by the date indicated: January 29, 2021

SECTION C – DESCRIPTION OF PROPOSED CURRICULUM/COURSE CHANGE
Briefly describe the proposed curriculum/course change in your unit and outline the request for support. Be as specific as possible, including with respect to the potential impact on courses/curricula in the other unit(s).

The departments of Chemistry and Microbiology are proposing changes to the Biotechnology as a result of curriculum revisions in the two departments. The Biotechnology program has been suspended since Fall 2018. There are a few students finishing the program. The revisions to the program have resulted in the deletion of the requirement to complete BIOL 2500; a decrease in the number of electives in the program, necessitating the deletion of suggested complementary minors; and an edit to the Co-op information.

SECTION D – UNIT(S) RECEIVING REQUEST FOR STATEMENT OF SUPPORT
List the faculties/colleges/schools/departments solicited for a statement of support.

Biological Sciences, Faculty of Science Co-op, Management, and the Faculty of Agricultural and Food Sciences

SECTION E – STATEMENT(S) OF SUPPORT RECEIVED
Attach responses received from other units to your faculty/college/school submission to SCCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Chemistry (002)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Science
Department or Program: Biological Sciences (071)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCCC should be aware of.

The Department of Biological Sciences is in support of the proposed change.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support.
- Indicate when your unit will submit corresponding changes to the SCCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCCC deadline indicated on the preceding page, in Section B.

This change should actually reduce the strain/demand on an already oversubscribed course.

SECTION J – SIGNATURES

Department Approval:  

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<tr>
<th>Name</th>
<th>Signature</th>
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<tbody>
<tr>
<td>Kevin G-E. Scott</td>
<td></td>
<td>19 January 2021</td>
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Faculty/College/School Approval:  

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<th>Name</th>
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<tr>
<td>Ben Pak Ching Li</td>
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<td>1/19/2021</td>
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*Signatures are not required for Spring 2021 submissions to SCCCC.*
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Choose one
Department or Program: Choose one

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Science
Department or Program: Science, Faculty of (02)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.
Science Co-op supports these changes as it will ensure there is common wording around the co-op requirements for all Science undergraduate degree programs which currently offer a co-op option.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- **Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.**

These changes will result in no impact on the Science Co-op Program.

SECTION J – SIGNATURES

Department Approval:  

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<th>Name</th>
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<tr>
<td>Geoffrey Anderson</td>
<td>[Signature]</td>
<td>January 20/21</td>
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Faculty/College/School Approval:

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<td>Ben Pak Ching Li</td>
<td>[Signature]</td>
<td>1/20/2021</td>
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*Signatures are not required for Spring 2021 submissions to SCCC.*
STATEMENT OF SUPPORT: PART B – RESPONSE & ACTION REQUIRED
SCCCC Fall 2020/Spring 2021

Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Choose one
Department or Program: Choose one

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Management
Department or Program: Management, Faculty of (06)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCCC should be aware of.

There is hardly impact of this change for Asper students. We support this change.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support.
- Indicate when your unit will submit corresponding changes to the SCCCC (e.g. Fall 2020 or Spring 2021). *In most cases, this will be the SCCCC deadline indicated on the preceding page, in Section B.*

None.

SECTION J – SIGNATURES

Department Approval: 

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Faculty/College/School Approval: 

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*Signatures are not required for Spring 2021 submissions to SCCC.*
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTIO N F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Choose one

SECTIO N G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Agricultural and Food Sciences
Department or Program: Agricultural and Food Sciences, Faculty of (07)

SECTIO N H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

The Faculty of Agricultural and Food Sciences is supportive of changes proposed to the Biotechnology program. There are no significant impacts on our programs. Our minors will continue to be available to any students who wish to register in them.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- **Indicate when your unit will submit corresponding changes to the SCCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCCC deadline indicated on the preceding page, in Section B.**

These changes have no impacts that require a submission.

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SECTION J – SIGNATURES

<table>
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<tr>
<th>Department Approval:</th>
<th>Jitendra Paliwal</th>
<th>Jitendra Paliwal</th>
<th>Jan. 25, 2021</th>
</tr>
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<tr>
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<th>Faculty/College/School Approval:</th>
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<tr>
<td>Martin Scanlon</td>
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</table>

*Signatures are not required for Spring 2021 submissions to SCCCC.*
UNDERGRADUATE COURSE INTRODUCTION
SCCC Fall 2020/Spring 2021

If the short course title, course number, subject code, or number of credit hours is to be changed, the current course MUST be deleted and re-introduced under the new title and/or course number and/or different credit hours.

Place the cursor over each form field for instructions. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes for additional instructions.

SECTION A – COURSE DETAILS

Faculty/College/School: Science
Department or Program: Chemistry (002)

Subject code: CHEM Course number: 1018 Confirm with Registrar prior to submitting to SCCC.

Long Title (maximum 90 characters):
Chemistry - The Central Science

Short Title (maximum 30 characters): Chemistry - The Central Science

Credit Hours: 3 Grading mode: Letter Grade Spanned Course: 

First term offered: Fall 2021

SECTION B – COURSE DESCRIPTION FOR ACADEMIC CALENDAR

Provide the course description, exactly as it would appear in the Academic Calendar. See the Guidelines for information on completing this section of the form, including the examples provided there.

CHEM 1018 Chemistry - The Central Science Cr. Hrs. 3

An atomic understanding of our world and ourselves impinges on every aspect of human life and culture. In this course students will learn the principles of chemistry that provide the deepest understanding of topics such as human health, the environment, energy, consumer products, fine arts, agriculture, technology, foods, industry, the history of science and more. The course will cover the classification of matter, chemical change as well as fundamental chemistry calculations. CHEM 1018 may not be used for credit in a Chemistry honours, joint honours, and major program. Not available to students who have previously obtained credit in (grade of C or better), or are concurrently registered in any Chemistry course, with the exception of CSKL 0100, CHEM 0900, the former CHEM 1000, and the former CHEM 1030.

SECTION C – RATIONALE FOR NEW COURSE (See the Guidelines for instructions on how to complete this section of the form.)

Responds to a recommendation in an external undergraduate program review.

Provide a brief rationale for the course introduction in the space provided.

CHEM 1018 is being proposed to introduce students lacking a chemistry foundation to the discipline of chemistry and the atomic worldview. Our Department has offered not-for-credit "Chemistry 40S equivalent" courses (CHEM 0900, CSKL 0100) to support students with no prior chemistry training. By offering CHEM 1018 instead, students will earn 3 cr. hr. for a course that is integrated into the Department course offerings. CHEM 1018 provides an early remedy for students entering University wishing to explore the possibility of a Science degree. Additionally, Science students will be able to use the credits toward their non-chemistry degree programs and non-science students will be able to use this course for their (S) requirement. Since the course is worth 3 cr. hr., students may use the course to count towards their full/part-time status required for student aid or subsidies.
SECTION D – REGISTRATION RESTRICTIONS

Indicate where registration is restricted to students in a faculty/college/school or academic program(s), including level or year of study. List the faculty/college/school and/or programs(s). *Indicate registration restrictions in the course description.*

Faculty/college/school restrictions:

N/A

Program restrictions (e.g. Honours):

N/A

SECTION E – ADDITIONAL COURSE DETAILS

Laboratory / Tutorial / Field Trip Requirement: *Indicate laboratory / tutorial / field trip requirement in course description.*

☐ Laboratory required
☐ Field trip required
☐ Tutorial required

Topics Courses:

☐ This is a topics course.
☐ This course can be completed as a topics course multiple times under different titles. *Note in course description in Section B of this form.*

Written English and Mathematics Requirements, Recommended Introductory Course List for U1: *Check all boxes that apply. Attach Request for Statement of Support Form(s) and responses received.*

☐ Course satisfies Written English requirement.
☐ Course satisfies Mathematics requirement.
☒ Accepted for Recommended Introductory Course List (RIC List)

SECTION F – RESULTING CHANGES TO COURSES/PROGRAM(S)

See the Guidelines for instructions on how to complete this section of the form. *Check all boxes that apply.*

This course introduction leads to changes to:

☒ other courses in your unit. *Submit a Course Modification proposal for those courses.*
☒ programs in your unit. *Submit Program Modification Forms.*
☒ courses in other academic units. *Requests for Statement of Support Forms are required.*
☒ program changes in other academic units. *Requests for Statement of Support Forms are required.*

List all courses and/or programs that are affected, including those in other departments/faculties/colleges/schools. Be as specific as possible.

ENG 1430; ENG 1440; ENG 1450; ENG 1460
GEOL 2500
MBIO 1410
CSKL 0100; CHEM 0900; CHEM 1100; CHEM 1120; CHEM 1122; CHEM 1301
BIOL 1020
Extended Education; USB; U1
B. Sc. Honours/Honours Co-op in Chemistry; B. Sc. Major/Major Co-op in Chemistry; Joint Honours in Chemistry-Physics

The corresponding Chemistry course modifications will be proposed in Fall 2021 SCCCC meeting
SECTION G – STATEMENT OF ADDITIONAL COSTS, WORKLOAD, AND/OR SUPPLIES
See the Guidelines for instructions on how to complete this section of the form. Indicate where not applicable.

The teaching load in the Department of Chemistry will increase by 3 cr. hr. but can be managed without increased staff. We expect to offer only one section of CHEM 1018 of up to 100 students.

SECTION H – PREREQUISITE, COREQUISITE, PRE- OR COREQUISITE, & EQUIVALENCY/MUTUAL EXCLUSIVITY
List all prerequisite, corequisite, pre- or corequisite, equivalent, and mutually exclusive courses, including all applicable previous courses numbers (both Aurora and IMS course numbers). See definitions in the Guidelines.

Indicate as a letter grade where a minimum grade for a prerequisite course, examination, or equivalency test is required. A minimum grade of “C” is assumed. A different minimum grade must be stated. Indicate where concurrency is allowed.

Prerequisites: (MUST be taken before)

Pre- or Corequisites (MUST be taken either before or at the same time)

Corequisites (MUST be taken at the same time and not be a spanned course)

Equivalent courses (May NOT be held with existing or former courses with equivalent content, same credit hours, same level. Can be used to meet same program requirements.)

Mutually exclusive courses (May NOT be held with existing or former courses with significant content overlap and/or different credit hours and/or different level or the same course previously offered as a topics course. Cannot be held together for credit or used to meet the same program requirement.)

any Chemistry course completed (C or better) or registered for, except CHEM 0900, 002.090, CHEM 1000, 002.100, CHEM 1030, 002.103, and CSKL 0100.
SECTION I – SUPPORTING DOCUMENTATION ATTACHED

See the Guidelines for information on required supporting documentation.

- Course outline (required)
- Library statement (normally required)
- Request for Statement of Support Forms and responses received
- Program Modification Form(s) – included with faculty/college/school submission to SCCCC

SECTION J – SIGNATURES*

Department Approval: Horace Luong  
Type Name  
November 6, 2020  
Date

Faculty/College/School Approval:

Ben Pak Ching Li  
Type Name  
1/12/2021  
Date

*Signatures are not required for Fall 2020 Submissions to SCCCC.
CHEM 1018: Chemistry – The Central Science (3 credit hours)

An atomic understanding of our world and ourselves impinges on every aspect of human life and culture. In this course students will learn the principles of chemistry that provide the deepest understanding of topics such as human health, the environment, energy, consumer products, fine arts, agriculture, technology, foods, industry, the history of science and more. The course will cover the classification of matter, chemical change as well as fundamental chemistry calculations. CHEM 1018 may not be used for credit in a Chemistry honours, joint honours, and major program. Not available to students who have previously obtained credit in (grade of C or better), or are concurrently registered in any Chemistry course, with the exception of CSKL 0100, CHEM 0900, the former CHEM 1000, and the former CHEM 1030.

Format: 3 lectures per week, 50 minutes each; or 2 lectures per week, 75 minutes each.

Textbook:

CHEM 1018 Topics

Physical and Chemical Changes and their Measurement
The physical and chemical changes in matter are explored qualitatively, and the foundation is set for their quantitative measurement, including an understanding of the reliability of data.

Atoms and Elements
Modern atomic theory is introduced, leading to a basic understanding of the periodic table. The determination of atomic masses using mass spectrometry is discussed, and the concept of the mole is introduced and applied to the assignment of molar mass.

Molecules and Compounds
Molecules and ionic compounds are distinguished via an understanding of the nature of their chemical bonds. Organic and inorganic compounds are represented pictorially, by chemical formulas, and by nomenclature. The determination of chemical formulas from experimental data is examined.

Chemical Reactions and Stoichiometry
The prediction and balancing of reactions is covered. Mole to mole ratios are used to predict limiting reactants, theoretical yields, and percent yields for chemical reactions.

Gases
The relationships among the physical properties of gases are explored, leading to the Ideal Gas Law and its applications. An understanding of gases and their diffusion and effusion is introduced through the Kinetic Molecular Theory model.

Acid-Base Chemistry
The Arrhenius and Brønsted-Lowry definitions of acids and bases are introduced. Acid and base strengths are quantified using pH and the acid and base ionization constants $K_a$ and $K_b$.

**Evaluation:**

- **Assignments:** There will be six assignments. An honesty declaration form must be completed for each assignment.
- **Exams:** There will be three term tests. One three-hour final exam will be held during the final examination period.
- **Course Grade:** Final grades will be determined as follows:
  - Assignments - 20%
  - Term Tests - 30%
  - Final Exam - 50%

Typical low-numerical-boundaries for the letter grades:

<table>
<thead>
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<tbody>
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<tr>
<td>C</td>
<td>60%</td>
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<tr>
<td>D</td>
<td>50%</td>
</tr>
<tr>
<td>F</td>
<td>&lt; 50%</td>
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</tbody>
</table>
Chemistry 40S Topics
Information from Manitoba Education

Topic 1: Reactions in Aqueous Solutions
Topic 2: Atomic Structure
Topic 3: Chemical Kinetics
Topic 4: Chemical Equilibrium
Topic 5: Acids and Bases
Topic 6: Electrochemistry

CHEM 1018 Topics
Bolded topics are topics overlapped with the Chemistry 40S curriculum.

Physical and Chemical Changes and their Measurement

Atoms and Elements

Molecules and Compounds

Chemical Reactions and Stoichiometry

Gases

Acid-Base Chemistry
University of Manitoba Libraries
Statement for Undergraduate Curriculum Change

Faculty: Science  
Department: Chemistry  
Course #: CHEM 1018  
Course Name: Chemistry - The Central Science

The Libraries' collection can support this new course, as it was described in the documents provided.

It is not expected that this proposed change will affect the Libraries' ability to continue to provide services such as research and teaching support, reference assistance, document delivery, and the technical infrastructure which allows the discovery and delivery of the Libraries' resources and services.

The library collection currently supports other introductory chemistry courses so it is expected that the existing monograph and journal collection will provide adequate support for the course. However, it is recommended that the chemistry liaison librarian be informed of any assignments that would require resources not currently available.

Marie Speare  
Science Liaison Librarian

Vickie Albrecht  
Acting Head, Sciences and Technology Library

Kristen Kruse  
Coordinator, Collections Management

Lisa Hanson O'Hare  
Vice Provost (Libraries) & University Librarian

November 10, 2020  
Date
STATEMENT OF SUPPORT: PART A – REQUEST FOR ACTION
SCCCC Fall 2020/Spring 2021

Complete Sections A through D of this form. Send a copy, together with Part B and any additional supporting documentation, to unit(s) from which you are seeking a statement of support. The completed form (Sections A through E) is to be submitted to SCCC along with Statements of Support (Part B) received. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes.

SECTION A – UNIT REQUESTING STATEMENT OF SUPPORT
Faculty/College/School: Science
Department or Program: Chemistry (002)

SECTION B – REASON FOR REQUEST FOR SUPPORT
☐ possible curricular overlap or infringement or conflict of jurisdiction with another unit(s)
☒ possible curriculum/course changes in another unit(s) arising from proposed curriculum/course change in your unit
☐ possible impact on demand (increased or decreased) for a specific course(s) in another unit(s)
☐ other (Please elaborate below, in Section C.)

Request for assessment of course intended to satisfy:
☐ Written English
☐ Mathematics
☒ RIC List

Indicate the SCCC deadline your unit will meet: ☒ Fall 2020
☐ Spring 2021

Indicate date on which request for support – Part A sent to other unit(s): November 12, 2020
Request that a response be provided by the date indicated: November 27, 2020

SECTION C – DESCRIPTION OF PROPOSED CURRICULUM/COURSE CHANGE

Briefly describe the proposed curriculum/course change in your unit and outline the request for support. Be as specific as possible, including with respect to the potential impact on courses/curricula in the other unit(s).

We plan on offering CHEM 1018, a new 3-credit hour lecture course which can serve as a prerequisite course to CHEM 1100, CHEM 1120 and CHEM 1122 for those who have not completed Chemistry 405 or its equivalent.

Courses Eng 1430, Eng 1440, Eng 1450, Eng 1460 may be affected by the introduction of CHEM 1018.

SECTION D – UNIT(S) RECEIVING REQUEST FOR STATEMENT OF SUPPORT

List the faculties/colleges/schools/departments solicited for a statement of support.

Engineering, Environment and Geography (Environment, Earth and Resources), Microbiology, USB, Extended Education, Biological Sciences, University 1

SECTION E – STATEMENT(S) OF SUPPORT RECEIVED

Attach responses received from other units to your faculty/college/school submission to SCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Chemistry (002)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Engineering
Department or Program: Engineering, Preliminary Year (130)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

The change will have no impact on our courses. Courses in the preliminary engineering program that listed Chemistry 40s, CHEM 0900 as pre-requisite will also list CHEM 1018.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

ENG 1430, ENG 1440, ENG 1450, ENG 1460 will list CHEM 1018 as equivalent to Chemistry 40s. Changes will be submitted to SCCC in Spring 2021.

SECTION J – SIGNATURES*

Department Approval: NA

Type Name ___________________________ Date ______________

Faculty/College/School Approval:

Ahmed Shalaby ___________________________ Nov. 17, 2020

Type Name ___________________________ Date ______________

*Signatures are not required for Fall 2020 submissions to SCCC.
STATEMENT OF SUPPORT: PART A – REQUEST FOR ACTION
SCCCC Fall 2020/Spring 2021

Complete Sections A through D of this form. Send a copy, together with Part B and any additional supporting documentation, to unit(s) from which you are seeking a statement of support. The completed form (Sections A through E) is to be submitted to SCCC along with Statements of Support (Part B) received. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes.

SECTION A – UNIT REQUESTING STATEMENT OF SUPPORT

Faculty/College/School: Science
Department or Program: Chemistry (002)

SECTION B – REASON FOR REQUEST FOR SUPPORT

☐ possible curricular overlap or infringement or conflict of jurisdiction with another unit(s)
✓ possible curriculum/course changes in another unit(s) arising from proposed curriculum/course change in your unit
☐ possible impact on demand (increased or decreased) for a specific course(s) in another unit(s)
☐ other (Please elaborate below, in Section C.)

Request for assessment of course intended to satisfy:

☐ Written English  ☐ Mathematics  ✓ RIC List

Indicate the SCCC deadline your unit will meet: ☐ Fall 2020  ✓ Spring 2021

Indicate date on which request for support – Part A sent to other unit(s): November 12, 2020
Request that a response be provided by the date indicated: November 27, 2020

SECTION C – DESCRIPTION OF PROPOSED CURRICULUM/COURSE CHANGE

Briefly describe the proposed curriculum/course change in your unit and outline the request for support. Be as specific as possible, including with respect to the potential impact on courses/curricula in the other unit(s).

We plan on offering CHEM 1018, a new 3-credit hour lecture course which can serve as a prerequisite course to CHEM 1100, CHEM 1120 and CHEM 1122, for those who have not completed Chemistry 40S or its equivalent.

Geol 2500 may be affected by the introduction of CHEM 1018.

SECTION D – UNIT(S) RECEIVING REQUEST FOR STATEMENT OF SUPPORT

List the faculties/colleges/schools/departments solicited for a statement of support.

Engineering, Environment and Geography (Environment, Earth and Resources), Microbiology, USB, Extended Education, Biological Sciences, University 1

SECTION E – STATEMENT(S) OF SUPPORT RECEIVED

Attach responses received from other units to your faculty/college/school submission to SCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the *Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes*. The completed form (Part B) is to be returned to the unit requesting support.

**SECTION F – UNIT REQUESTING SUPPORT**

Faculty/College/School: Science  
Department or Program: Chemistry (002)

**SECTION G – UNIT RESPONDING TO REQUEST**

Faculty/College/School: Environment, Earth, and Resources  
Department or Program: Geological Sciences (007)

**SECTION H – RESPONSE TO REQUEST**

Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

Minimal impact

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support.
- Indicate when your unit will submit corresponding changes to the SCCC (e.g., Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

Minimal impact

SECTION J – SIGNATURES*

Department Approval: ____________________________ Date
Alfredo Camacho December 1, 2020
Type Name

Faculty/College/School Approval:

______________________________ Date
Type Name

*Signatures are not required for Fall 2020 submissions to SCCC.
STATEMENT OF SUPPORT: PART A – REQUEST FOR ACTION
SCCCC Fall 2020/Spring 2021

Complete Sections A through D of this form. Send a copy, together with Part B and any additional supporting documentation, to unit(s) from which you are seeking a statement of support. The completed form (Sections A through E) is to be submitted to SCCCC along with Statements of Support (Part B) received. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes.

SECTION A – UNIT REQUESTING STATEMENT OF SUPPORT

Faculty/College/School: Science
Department or Program: Chemistry (002)

SECTION B – REASON FOR REQUEST FOR SUPPORT

☐ possible curricular overlap or infringement or conflict of jurisdiction with another unit(s)
☒ possible curriculum/course changes in another unit(s) arising from proposed curriculum/course change in your unit
☐ possible impact on demand (increased or decreased) for a specific course(s) in another unit(s)
☐ other (Please elaborate below, in Section C.)

Request for assessment of course intended to satisfy:

☐ Written English  ☐ Mathematics  ☒ RIC List

Indicate the SCCCC deadline your unit will meet: ☒ Fall 2020  ☒ Spring 2021

Indicate date on which request for support – Part A sent to other unit(s): November 12, 2020
Request that a response be provided by the date indicated: November 27, 2020

SECTION C – DESCRIPTION OF PROPOSED CURRICULUM/COURSE CHANGE

Briefly describe the proposed curriculum/course change in your unit and outline the request for support. Be as specific as possible, including with respect to the potential impact on courses/curricula in the other unit(s).

We plan on offering CHEM 1018, a new 3-credit hour lecture course which can serve as a prerequisite course to CHEM 1100, CHEM 1120 and CHEM 1122 for those who have not completed Chemistry 40S or its equivalent.

MBIO 1410 may be affected by the introduction of CHEM 1018.

SECTION D – UNIT(S) RECEIVING REQUEST FOR STATEMENT OF SUPPORT

List the faculties/colleges/schools/departments solicited for a statement of support.

Engineering, Environment and Geography (Environment, Earth and Resources), Microbiology, USB, Extended Education, Biological Sciences, University 1

SECTION E – STATEMENT(S) OF SUPPORT RECEIVED

Attach responses received from other units to your faculty/college/school submission to SCCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

### SECTION F – UNIT REQUESTING SUPPORT

Faculty/College/School: Science  
Department or Program: Chemistry (002)

### SECTION G – UNIT RESPONDING TO REQUEST

Faculty/College/School: Science  
Department or Program: Microbiology (060)

### SECTION H – RESPONSE TO REQUEST

Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCCC should be aware of.

The department of Microbiology supports the introduction of CHEM 1018 as a course for non-majors.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- Indicate when your unit will submit corresponding changes to the SCCC (e.g., Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

MBIO 1410 has had a requirement for either high school biology (40S), or high school 40S chemistry or CHEM 1000. With the deletion of CHEM 1000, CHEM 1018 may be considered as a suitable replacement prerequisite for students who need suitable background in chemistry. Any modification to the prerequisites for MBIO 1410 in light of the introduction of CHEM 1018 would be made for the Spring meeting of the SCCC in 2021.

SECTION I – SIGNATURES*

Department Approval: Richard Sparling 12th of November 2020.
Type Name Date

Faculty/College/School Approval:

Ben Pak Chirg Li 1/12/2021
Type Name Date

*Signatures are not required for Fall 2020 submissions to SCCC.
STATEMENT OF SUPPORT: PART A – REQUEST FOR ACTION
SCCCC Fall 2020/Spring 2021

Complete Sections A through D of this form. Send a copy, together with Part B and any additional supporting documentation, to unit(s) from which you are seeking a statement of support. The completed form (Sections A through E) is to be submitted to SCCC along with Statements of Support (Part B) received. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes.

SECTION A – UNIT REQUESTING STATEMENT OF SUPPORT
Faculty/College/School: Science
Department or Program: Chemistry (002)

SECTION B – REASON FOR REQUEST FOR SUPPORT
☐ possible curricular overlap or infringement or conflict of jurisdiction with another unit(s)
☑ possible curriculum/course changes in another unit(s) arising from proposed curriculum/course change in your unit
☐ possible impact on demand (increased or decreased) for a specific course(s) in another unit(s)
☐ other (Please elaborate below, in Section C.)

Request for assessment of course intended to satisfy:
☐ Written English ☐ Mathematics ☑ RIC List

Indicate the SCCC deadline your unit will meet: ☑ Fall 2020 ☑ Spring 2021

Indicate date on which request for support – Part A sent to other unit(s): November 12, 2020
Request that a response be provided by the date indicated: November 27, 2020

SECTION C – DESCRIPTION OF PROPOSED CURRICULUM/COURSE CHANGE
Briefly describe the proposed curriculum/course change in your unit and outline the request for support. Be as specific as possible, including with respect to the potential impact on courses/curricula in the other unit(s).

We plan on offering CHEM 1018, a new 3-credit hour lecture course which can serve as a prerequisite course to CHEM 1100, CHEM 1120 and CHEM 1122 for those who have not completed Chemistry 40S or its equivalent.

CHEM 1301 may be affected by the introduction of CHEM 1018.

SECTION D – UNIT(S) RECEIVING REQUEST FOR STATEMENT OF SUPPORT
List the faculties/colleges/schools/departments solicited for a statement of support.
Engineering, Environment and Geography (Environment, Earth and Resources), Microbiology, USB, Extended Education, Biological Sciences

SECTION E – STATEMENT(S) OF SUPPORT RECEIVED
Attach responses received from other units to your faculty/college/school submission to SCCC.
STATEMENT OF SUPPORT: PART B – RESPONSE & ACTION REQUIRED
SCCCC Fall 2020/Spring 2021

Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F - UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Chemistry (002)

SECTION G - UNIT RESPONDING TO REQUEST
Faculty/College/School: Université de Saint-Boniface
Department or Program: sciences, Faculte des (USB)

SECTION H - RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

We have reservations but defer to our U of M's colleagues and support their proposal. USB's Faculté des arts et des will consult and consider whether similar curricular changes should be submitted for USB programs.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

The prerequisite for CHEM 1101 and CHEM 1121 will need to be modified to take into consideration the new course CHEM 1018. Those changes will be submitted to the SCCC no later than Spring 2022.

SECTION J – SIGNATURES*

Department Approval: Mathias Oulé
Type Name
Date
November 23, 2020

Faculty/College/School Approval:

Alexandre Brassard
Type Name
Date
November 23, 2020

*Signatures are not required for Fall 2020 submissions to SCCC.
STATEMENT OF SUPPORT: PART A – REQUEST FOR ACTION
SCCCC Fall 2020/Spring 2021

Complete Sections A through D of this form. Send a copy, together with Part B and any additional supporting documentation, to unit(s) from which you are seeking a statement of support. The completed form (Sections A through E) is to be submitted to SCCC along with Statements of Support (Part B) received. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes.

SECTION A – UNIT REQUESTING STATEMENT OF SUPPORT

Faculty/College/School: Science
Department or Program: Chemistry (002)

SECTION B – REASON FOR REQUEST FOR SUPPORT

☒ possible curricular overlap or infringement or conflict of jurisdiction with another unit(s)
☐ possible curriculum/course changes in another unit(s) arising from proposed curriculum/course change in your unit
☒ possible impact on demand (increased or decreased) for a specific course(s) in another unit(s)
☐ other (Please elaborate below, in Section C.)

Request for assessment of course intended to satisfy:

☐ Written English ☐ Mathematics ☑ RIC List

Indicate the SCCC deadline your unit will meet: ☑ Fall 2020 ☑ Spring 2021

Indicate date on which request for support – Part A sent to other unit(s): November 12, 2020
Request that a response be provided by the date indicated: November 27, 2020

SECTION C – DESCRIPTION OF PROPOSED CURRICULUM/COURSE CHANGE

Briefly describe the proposed curriculum/course change in your unit and outline the request for support. Be as specific as possible, including with respect to the potential impact on courses/curricula in the other unit(s).

We plan on offering CHEM 1018, a new 3-credit hour lecture course which can serve as a prerequisite course to CHEM 1100, CHEM 1120 and CHEM 1122 for those who have not completed Chemistry 40S or its equivalent.

CSKL 0100 may be affected by the introduction of this course.

SECTION D – UNIT(S) RECEIVING REQUEST FOR STATEMENT OF SUPPORT

List the faculties/colleges/schools/departments solicited for a statement of support.

Engineering, Environment and Geography (Environment, Earth and Resources), Microbiology, USB, Extended Education, Biological Sciences, University 1

SECTION E – STATEMENT(S) OF SUPPORT RECEIVED

Attach responses received from other units to your faculty/college/school submission to SCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT

Faculty/College/School:  Science
Department or Program: Chemistry (002)

SECTION G – UNIT RESPONDING TO REQUEST

Faculty/College/School:  Extended Education
Department or Program: Extended Education (26)

SECTION H – RESPONSE TO REQUEST

Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

No concerns
Extended Education has been in conversation with the Faculty of Science regarding the creation of degree credit preparatory science courses
We are in support of this change

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support.
- Indicate when your unit will submit corresponding changes to the SCCC (e.g., Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

CHEMISTRY SKILLS (CSKL) 100 - non-degree credit preparatory course
the suite of preparatory courses offered by Extended Education are not part of a program thus the potential cancelling of these non-degree credit courses will not have extended impacts to our programming

SECTION J – SIGNATURES*

Department Approval: NA

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Faculty/College/School Approval:

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<th>NOV 17 2020</th>
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<tr>
<td>Type Name</td>
<td>Date</td>
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*Signatures are not required for Fall 2020 submissions to SCCC.
Complete Sections A through D of this form. Send a copy, together with Part B and any additional supporting documentation, to unit(s) from which you are seeking a statement of support. The completed form (Sections A through E) is to be submitted to SCCC along with Statements of Support (Part B) received. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes.

SECTION A – UNIT REQUESTING STATEMENT OF SUPPORT

Faculty/College/School: Science
Department or Program: Chemistry (002)

SECTION B – REASON FOR REQUEST FOR SUPPORT

☐ possible curricular overlap or infringement or conflict of jurisdiction with another unit(s)
☑ possible curriculum/course changes in another unit(s) arising from proposed curriculum/course change in your unit
☐ possible impact on demand (increased or decreased) for a specific course(s) in another unit(s)
☐ other (Please elaborate below, in Section C.)

Request for assessment of course intended to satisfy:

☐ Written English ☐ Mathematics ☑ RIC List

Indicate the SCCC deadline your unit will meet: ☑ Fall 2020 ☑ Spring 2021

Indicate date on which request for support – Part A sent to other unit(s): November 12, 2020

Request that a response be provided by the date indicated: November 27, 2020

SECTION C – DESCRIPTION OF PROPOSED CURRICULUM/COURSE CHANGE

Briefly describe the proposed curriculum/course change in your unit and outline the request for support. Be as specific as possible, including with respect to the potential impact on courses/curricula in the other unit(s).

We plan on offering CHEM 1018, a new 3-credit hour lecture course which can serve as a prerequisite course to CHEM 1100, CHEM 1120 and CHEM 1122 for those who have not completed Chemistry 405 or its equivalent.

Biol 1020 may be affected by the introduction of CHEM 1018.

SECTION D – UNIT(S) RECEIVING REQUEST FOR STATEMENT OF SUPPORT

List the faculties/colleges/schools/departments solicited for a statement of support.

Engineering, Environment and Geography (Environment, Earth and Resources), Microbiology, USB, Extended Education, Biological Sciences, University 1

SECTION E – STATEMENT(S) OF SUPPORT RECEIVED

Attach responses received from other units to your faculty/college/school submission to SCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Chemistry (002)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Science
Department or Program: Biological Sciences (071)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

The Department of Biological Sciences is in support of the creation of this new course.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support.
- Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

This new course should have little to no impact on the offerings of our programs.

SECTION J – SIGNATURES*

Department Approval:  Kevin G-E. Scott  14 November 2020
Type Name  Date

Faculty/College/School Approval:

Ben Pak Ching Li  1/12/2021
Type Name  Date

*Signatures are not required for Fall 2020 submissions to SCCC.
STATEMENT OF SUPPORT: PART A – REQUEST FOR ACTION
SCCCC Fall 2020/Spring 2021

Complete Sections A through D of this form. Send a copy, together with Part B and any additional supporting documentation, to unit(s) from which you are seeking a statement of support. The completed form (Sections A through E) is to be submitted to SCCC along with Statements of Support (Part B) received. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes.

SECTION A – UNIT REQUESTING STATEMENT OF SUPPORT

Faculty/College/School: Science
Department or Program: Chemistry (002)

SECTION B – REASON FOR REQUEST FOR SUPPORT

☐ possible curricular overlap or infringement or conflict of jurisdiction with another unit(s)
☒ possible curriculum/course changes in another unit(s) arising from proposed curriculum/course change in your unit
☐ possible impact on demand (increased or decreased) for a specific course(s) in another unit(s)
☐ other (Please elaborate below, in Section C.)

Request for assessment of course intended to satisfy:

☐ Written English ☐ Mathematics ☒ RIC List

Indicate the SCCC deadline your unit will meet: ☑ Fall 2020 ☒ Spring 2021

Indicate date on which request for support – Part A sent to other unit(s): November 30, 2020
Request that a response be provided by the date indicated: December 7, 2020

SECTION C – DESCRIPTION OF PROPOSED CURRICULUM/COURSE CHANGE

Briefly describe the proposed curriculum/course change in your unit and outline the request for support. Be as specific as possible, including with respect to the potential impact on courses/curricula in the other unit(s).

We plan on offering CHEM 1018, a new 3-credit hour lecture course which can serve as a prerequisite course to CHEM 1100, CHEM 1120 and CHEM 1122 for those who have not completed Chemistry 40S or its equivalent.

SECTION D – UNIT(S) RECEIVING REQUEST FOR STATEMENT OF SUPPORT

List the faculties/colleges/schools/departments solicited for a statement of support.

Engineering, Environment and Geography (Environment, Earth and Resources), Microbiology, USB, Extended Education, U1, Biological Sciences

SECTION E – STATEMENT(S) OF SUPPORT RECEIVED

Attach responses received from other units to your faculty/college/school submission to SCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Chemistry (002)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: University 1
Department or Program: Choose one

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

University 1 is in support of this request and will add the course to the RIC List once approved by Senate.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support.
- Indicate when your unit will submit corresponding changes to the SCCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCCC deadline indicated on the preceding page, in Section B.

There will be minimal impact on the U1 program specifically; however, as this course will prepare students bound for Science programs with necessary foundational information and skills.
University 1 is in full support of the Faculty of Science making this new offering available to students.

SECTION J – SIGNATURES*

Department Approval:  

Type Name ____________________________ Date ____________________________

Faculty/College/School Approval:  

All Wood-Warren ____________________________ January 5, 2021 

Type Name ____________________________ Date ____________________________

*Signatures are not required for Fall 2020 submissions to SCCCC.
If the short course title, course number, subject code or number of credit hours is to be changed, do not use this form. The current course MUST be deleted and re-introduced under a new title and/or number and/or different credit hours.

See the Guidelines for Completion of Proposal for Undergraduate/Certificate Course and Curriculum Changes for additional instructions.

SECTION A – COURSE DETAILS

Faculty/College/School: Science

Department or Program: Chemistry (002)

Subject code: CHEM Course number: 2730

Current Long Title: Elements of Biochemistry 1

Revised Long Title (maximum 90 characters):

Current Credit Hours: 3 Revised grading mode: Choose one

[Indicate Pass/Fail in revised course description]

Changes Take Effect: Fall 2021

SECTION B – MODIFIED COURSE DESCRIPTION

Provide the course description, exactly as it would appear in the Academic Calendar. See the Guidelines for information on completing this section of the form, including the examples provided there.

CHEM 2730 Elements of Biochemistry 1 Cr.Hrs. 3

Basic concepts of biochemistry including the properties of biomolecules (amino acids and proteins, enzymes, carbohydrates, lipids, and nucleic acids) and aspects of energy production in cells. Primarily for students in Agricultural and Food Sciences and Four Year Biological Sciences programs in Science. May not be used as part of an Honours, Major, or Minor program in Chemistry. May not be used as part of an Honours or Major program in Microbiology. This course is also given in Microbiology as MBIO 2730. May not be held with the former CHEM 2360, CHEM 2361, CHEM 2700, the former CHEM 2770, the former CHEM 2860, the former MBIO 2360, MBIO 2361, MBIO 2700, MBIO 2730, or the former MBIO 2770. Prerequisites: [one of CHEM 1110, CHEM 1130, the former CHEM 1310, CHEM 1311, or the former CHEM 1320] and [six credit hours of university level BIOL courses or HEAL 1500 and HEAL 1502].

SECTION C – CURRENT COURSE DESCRIPTION

Provide the current course description exactly as it appears in the current Academic Calendar.

CHEM 2730 Elements of Biochemistry 1 Cr.Hrs. 3

Basic concepts of biochemistry including the properties of biomolecules (amino acids and proteins, enzymes, carbohydrates, lipids, and nucleic acids) and aspects of energy production in cells. Primarily for students in Agricultural and Food Sciences and Four Year Biological Sciences programs in Science. May not be used as part of an Honours, Major, General, or Minor program in Chemistry or in Microbiology. This course is also given in Microbiology as MBIO 2730. May not be held with the former CHEM 2360, CHEM 2361, CHEM 2700, the former CHEM 2770, the former CHEM 2860, the former MBIO 2360, MBIO 2361, MBIO 2700, MBIO 2730, or the former MBIO 2770. Prerequisites: [one of CHEM 1110, CHEM 1130, the former CHEM 1310, CHEM 1311, or the former CHEM 1320] and six credit hours of university level BIOL courses.
SECTION D - RATIONALE
Provide a brief description of the change(s) and a rationale below.

☑️ Responds to a recommendation in an external undergraduate program review.

The new B.Sc. General degree aims to expand the breadth of courses a student can take. CHEM 2730 will be accepted as a course in the advanced Sciences credit which can give students a glimpse of biochemistry topics. MBIO 2730's course description does not indicate that MBIO 2730 cannot be used for a Minor in Microbiology. We've removed the mentioning of Minor in Microbiology in CHEM 2730 so that it is consistent with MBIO 2730. The biology preparation provided by HEAL 1500 and HEAL 1502 is more than enough biology material for students to be prepared for CHEM/MBIO 2730.

SECTION E - DETAILS OF PROPOSED MODIFICATION(S)
Adding registration restriction:
Indicate where registration is restricted to students in a faculty/college/school or academic program(s), including level or year of study. List the faculty/college/school and/or programs(s). Indicate registration restrictions in the course description.

Faculty/college/school restrictions:

Program restrictions (e.g. Honours):

Adding / Removing Required Laboratory / Tutorial / Field Trip / Other Activity: indicate required laboratory / tutorial / field trip / other activity in course description. (Do not use this section to indicate the course being modified already includes one of these requirements.)
The course is being modified in order to:

☐ Add a laboratory
☐ Add a tutorial
☐ Add a field trip
☐ Add other activity
☐ Remove a laboratory
☐ Remove a tutorial
☐ Remove a field trip
☐ Remove other activity
Describe the Other Activity below or use this space to seek SCCCC's advice on whether to note an activity in the description.

Written English and Mathematics Requirements, Recommended Introductory Course List for U1: (Do not use this section to indicate the course already satisfies the M/W requirement or is on the RIC List.)
The course, as modified, will:

☐ Satisfy the W requirement and is to be added to the List of Written English Courses.*
☐ Satisfy the M requirement and is to be added to the List of Mathematics Courses.*
☐ Has been accepted for, and is to be added to the RIC List. *

☐ No longer satisfy the W requirement and is to be removed from the List of Written English Courses. *
☐ No longer satisfy the M requirement and is to be removed from the List of Mathematics Courses.*
☐ No longer satisfy and is to be removed from the RIC list. *

*Attach Request for Statement of Support Form(s) and responses received.
SECTION F – RESULTING CHANGES TO COURSES/PROGRAM(S)

See the Guidelines for instructions on how to complete this section of the form. Check all boxes that apply.

This course modification leads to changes to:

☐ other courses in your unit Submit Course Modification Forms for those courses.
☐ programs in your unit Submit Program Modification Forms.
☐ courses in other academic units Requests for Statement of Support Forms are required.
☐ program changes in other academic units Requests for Statement of Support Forms are required.
☐ Other units that use the course will be advised of changes to the course description, including content, prerequisites, corequisites, equivalent and mutually exclusive courses. Requests for Statement of Support Forms are required.

List all courses and/or programs that are affected (e.g. other courses that use the modified course as a prerequisite or corequisite; programs that use the course as a required/elective course), including those in other departments/faculties/colleges/schools. Be as specific as possible.

CHEM 2700, MBIO 2700, CHEM 2750, MBIO 2750, BIOL 3400, CHEM 2361, ANSC 2520, FOOD 2500, FOOD 3200, FOOD 3500, FOOD 4540, HNSC 2140, HNSC 3330, HNSC 4540, MBIO 2361, MBIO 3410, MBIO 3411, PLNT 2530, PLNT 3400, Agriculture; Agroecology; Agronomy; Animal Science; Animal Systems; B.Sc. Major/Major Co-op and B.Sc. Honours/Honours Co-op in Biological Sciences; Food Science; Human Nutritional Sciences; Interdisciplinary Health; Plant Biotechnology; Plant Science; Pre-Vet Medicine; Université de Saint-Boniface; B.Sc. General, Minor Microbiology.

SECTION G – STATEMENT OF ADDITIONAL COSTS, WORKLOAD, AND/OR SUPPLIES

See the Guidelines for instructions on how to complete this section of the form. Indicate where not applicable.

We anticipate no major change in workload of academic staff as a result of the course/calendar description change.

SECTION H – CHANGES TO PREREQUISITE, COREQUISITE, PRE- OR COREQUISITE, & EQUIVALENCY/MUTUAL EXCLUSIVITY

Include both Aurora and IMS course numbers. Indicate where a minimum letter grade, other than a "C" grade, is required for a prerequisite course, examination, or equivalency test. Indicate where concurrency is allowed. See definitions in the Guidelines.

Prerequisites: (MUST be taken before)

Adding:

and [six credit hours of university level BIOL courses or HEAL 1500 and HEAL 1502].

Removing:
Pre- or Corequisites (MUST be taken either before or at the same time)
    Adding:

    Removing:

Corequisites (MUST be taken at the same time and not be a spanned course)
    Adding:

    Removing:

Equivalent courses (May NOT be held with existing or former courses with equivalent content, same credit hours, same level. Can be used to meet same program requirements.)
    Adding:

    Removing:

Mutually exclusive courses (May NOT be held with existing or former courses with significant content overlap and/or different credit hours and/or different level or the same course previously offered as a topics course. Cannot be held together for credit or used to meet the same program requirement.)
    Adding: Indicate title of specific topics course sections, if appropriate.

    Removing:

SECTION I – SUPPORTING DOCUMENTATION ATTACHED
See the Guidelines for information on required supporting documentation. Attach documents in the following order.

☐ Course outline
☐ Library statement
☑ Request for Statement of Support Form(s) and responses received
☐ Program Modification Form(s) – included with faculty/college/school submission to SCCCC

SECTION I – SIGNATURES

Department Approval: Horace Luong      Horace Luong  December 14, 2020

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<th>Type Name</th>
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Faculty/College/School Approval:

Ben Pak Ching Li  1/15/2021

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*Signatures are not required for Spring 2021 submissions to SCCCC.
UNIVERSITY OF MANITOBA

UNDERGRADUATE COURSE MODIFICATION
SCCC Fall 2020/Spring 2021

If the short course title, course number, subject code or number of credit hours is to be changed, do not use this form. The current course MUST be deleted and re-introduced under a new title and/or number and/or different credit hours.

See the Guidelines for Completion of Proposal for Undergraduate/Certificate Course and Curriculum Changes for additional instructions.

SECTION A - COURSE DETAILS

Faculty/College/School: Science
Department or Program: Chemistry (002)
Subject code: CHEM Course number: 2740
Current Long Title:
Introduction to the Biochemistry Laboratory
Revised Long Title (maximum 90 characters):

Current Credit Hours: 3 Revised grading mode: Choose one

Changes Take Effect: Fall 2021

[Indicate Pass/Fail in revised course description]

SECTION B - MODIFIED COURSE DESCRIPTION

Provide the course description, exactly as it would appear in the Academic Calendar. See the Guidelines for information on completing this section of the form, including the examples provided there.

CHEM 2740 Introduction to the Biochemistry Laboratory Cr.Hrs. 3
This course is intended primarily for students in Agricultural and Food Sciences and four-year Biological Science programs who would benefit from hands-on experience of the most commonly used techniques in the modern biochemistry laboratory. The course will provide practical training in the use of micropipettors and spectrophotometers for the quantitation and analysis of proteins and enzymes, carbohydrates and DNA. Students will learn the application of various chromatographic and centrifugation-based techniques for biomolecule purification and analysis with an emphasis on topics of specific relevance to agriculture and food sciences. May not be used as part of an Honours, Major, or Minor program in Chemistry or in Microbiology. May not be held with the former CHEM 2370, CHEM 2371, CHEM 2720, the former CHEM 2780, the former Mbio 2370, MBIO 2371, the former MBIO 2780. Prerequisites: One of CHEM 1110, CHEM 1130, the former CHEM 1310, CHEM 1311, or the former CHEM 1320.

SECTION C - CURRENT COURSE DESCRIPTION

Provide the current course description exactly as it appears in the current Academic Calendar.

CHEM 2740 Introduction to the Biochemistry Laboratory Cr.Hrs. 3
This course is intended primarily for students in Agricultural and Food Sciences and four-year Biological Science programs who would benefit from hands-on experience of the most commonly used techniques in the modern biochemistry laboratory. The course will provide practical training in the use of micropipettors and spectrophotometers for the quantitation and analysis of proteins and enzymes, carbohydrates and DNA. Students will learn the application of various chromatographic and centrifugation-based techniques for biomolecule purification and analysis with an emphasis on topics of specific relevance to agriculture and food sciences. May not be used as part of an Honours, Major, General, or Minor program in Chemistry or in Microbiology. May not be held with the former CHEM 2370, CHEM 2371, CHEM 2720, the former CHEM 2780, the former Mbio 2370, MBIO 2371, the former MBIO 2780. Prerequisites: One of CHEM 1110, CHEM 1130, the former CHEM 1310, CHEM 1311, or the former CHEM 1320.
SECTION D – RATIONALE
Provide a brief description of the change(s) and a rationale below.
☑ Responds to a recommendation in an external undergraduate program review.

The new B.Sc. General degree aims to expand the breadth of courses a student can take. CHEM 2740 will be accepted as a course in the advanced Sciences credit which can give students a glimpse of biochemistry topics.

SECTION E – DETAILS OF PROPOSED MODIFICATION(S)
Adding registration restriction:
Indicate where registration is restricted to students in a faculty/college/school or academic program(s), including level or year of study. List the faculty/college/school and/or programs(s). Indicate registration restrictions in the course description.

Faculty/college/school restrictions:

Program restrictions (e.g. Honours):

Adding / Removing Required Laboratory / Tutorial / Field Trip / Other Activity: Indicate required laboratory / tutorial / field trip / other activity in course description. (Do not use this section to indicate the course being modified already includes one of these requirements.)

The course is being modified in order to:
☐ Add a laboratory ☐ Remove a laboratory
☐ Add a tutorial ☐ Remove a tutorial
☐ Add a field trip ☐ Remove a field trip
☐ Add other activity ☐ Remove other activity

Describe the Other Activity below or use this space to seek SCCC’s advice on whether to note an activity in the description.

Written English and Mathematics Requirements, Recommended Introductory Course List for U1: (Do not use this section to indicate the course already satisfies the M/W requirement or is on the RIC List.)
The course, as modified, will:
☐ Satisfy the W requirement and is to be added to the List of Written English Courses.*
☐ Satisfy the M requirement and is to be added to the List of Mathematics Courses.*
☐ Has been accepted for, and is to be added to the RIC List. *
☐ No longer satisfy the W requirement and is to be removed from the List of Written English Courses. *
☐ No longer satisfy the M requirement and is to be removed from the List of Mathematics Courses.*
☐ No longer satisfy and is to be removed from the RIC list. *

*Attach Request for Statement of Support Form(s) and responses received.
SECTION F – RESULTING CHANGES TO COURSES/PROGRAM(S)

See the Guidelines for instructions on how to complete this section of the form. Check all boxes that apply.

This course modification leads to changes to:

- [ ] other courses in your unit Submit Course Modification Forms for those courses.
- [ ] programs in your unit Submit Program Modification Forms.
- [ ] courses in other academic units Requests for Statement of Support Forms are required.
- [ ] program changes in other academic units Requests for Statement of Support Forms are required.
- [X] Other units that use the course will be advised of changes to the course description, including content, prerequisites, corequisites, equivalent and mutually exclusive courses. Requests for Statement of Support Forms are required.

List all courses and/or programs that are affected (e.g. other courses that use the modified course as a prerequisite or corequisite; programs that use the course as a required/elective course), including those in other departments/faculties/colleges/schools. Be as specific as possible.

ANSC 2520, BIOL 3500, BIOL 3501, BIOL 3400, BIOL 4380, CHEM 2361, CHEM 2371, FOOD 2500, FOOD 3200, FOOD 3500, FOOD 4540, HNSC 2140, HNSC 3300, HNSC 3310, HNSC 3330, HNSC 4540, MBIO 2361, MBIO 2371, PLNT 2530, PLNT 3400; Agriculture; Agroecology; Agronomy; Animal Systems; Animal Science; Biological Sciences; Food Science; Human Nutritional Sciences; Interdisciplinary Health Program; Plant Biotechnology; Plant Science; Pre-Veterinary Medicine; Université de Saint-Boniface., B.Sc. General.

SECTION G – STATEMENT OF ADDITIONAL COSTS, WORKLOAD, AND/OR SUPPLIES

See the Guidelines for instructions on how to complete this section of the form. Indicate where not applicable.

We anticipate no major change in workload of academic staff as a result of the course/calendar description change.

SECTION H – CHANGES TO PREREQUISITE, COREQUISITE, PRE- OR COREQUISITE, & EQUIVALENCY/MUTUAL EXCLUSIVITY

Include both Aurora and IMS course numbers. Indicate where a minimum letter grade, other than a "C" grade, is required for a prerequisite course, examination, or equivalency test. Indicate where concurrency is allowed. See definitions in the Guidelines.

Prerequisites: (MUST be taken before)

Adding:

Removing:
Pre- or Corequisites (MUST be taken either before or at the same time)

Adding:

Removing:

Corequisites (MUST be taken at the same time and not be a spanned course)

Adding:

Removing:

Equivalent courses (May NOT be held with existing or former courses with equivalent content, same credit hours, same level. Can be used to meet same program requirements.)

Adding:

Removing:

Mutually exclusive courses (May NOT be held with existing or former courses with significant content overlap and/or different credit hours and/or different level or the same course previously offered as a topics course. Cannot be held together for credit or used to meet the same program requirement.)

Adding: Indicate title of specific topics course sections, if appropriate.

Removing:

SECTION I – SUPPORTING DOCUMENTATION ATTACHED

See the Guidelines for information on required supporting documentation. Attach documents in the following order.

☐ Course outline
☐ Library statement
☐ Request for Statement of Support Form(s) and responses received
☐ Program Modification Form(s) – included with faculty/college/school submission to SCCCC

SECTION J – SIGNATURES

Department Approval: Horace Luong Horace Luong

Type Name Signature * Date

December 14, 2020

Faculty/College/School Approval:

Ben Pak Ching Li

Type Name Signature * Date

1/15/2021

*Signatures are not required for Spring 2021 submissions to SCCCC.
UNIVERSITY OF MANITOBA

UNDERGRADUATE COURSE MODIFICATION
SCCC Fall 2020/Spring 2021

If the short course title, course number, subject code or number of credit hours is to be changed, do not use this form. The current course MUST be deleted and re-introduced under a new title and/or number and/or different credit hours.
See the Guidelines for Completion of Proposal for Undergraduate/Certificate Course and Curriculum Changes for additional instructions.

SECTION A – COURSE DETAILS
Faculty/College/School:  Science
Department or Program: Chemistry (002)
Subject code: CHEM  Course number: 2750
Current Long Title:
Elements of Biochemistry 2
Revised Long Title (maximum 90 characters):

Current Credit Hours:  3
Revised grading mode:  Choose one
[Indicate Pass/Fail in revised course description]

Changes Take Effect:  Fall 2021

SECTION B – MODIFIED COURSE DESCRIPTION
Provide the course description, exactly as it would appear in the Academic Calendar. See the Guidelines for information on completing this section of the form, including the examples provided there.

CHEM 2750 Elements of Biochemistry 2 Cr.Hrs. 3
The continuation of CHEM/MBIO 2730, dealing with nitrogen and lipid metabolism, representative biosynthetic pathways, and synthesis and importance of DNA, RNA and proteins. Primarily for students in Agricultural and Food Sciences and four-year Biological Science programs in Science. May not be used as part of an Honours, Major, or Minor program in Chemistry. May not be used as part of an Honours or Major program in Microbiology. This course is also given in Microbiology as MBIO 2750. May not be held with the former CHEM 2370, CHEM 2371, CHEM 2710, the former CHEM 2780, the former CHEM 2860, the former MBIO 2370, MBIO 2371, MBIO 2750, or the former MBIO 2780. Prerequisites: one of CHEM 2730, CHEM 2700, the former CHEM 2770, the former CHEM 2860, CHEM 2361, the former CHEM 2860, MBIO 2730, MBIO 2700, the former MBIO 2770, the former MBIO 2360, or MBIO 2361.

SECTION C – CURRENT COURSE DESCRIPTION
Provide the current course description exactly as it appears in the current Academic Calendar.

CHEM 2750 Elements of Biochemistry 2 Cr.Hrs. 3
The continuation of CHEM/MBIO 2730, dealing with nitrogen and lipid metabolism, representative biosynthetic pathways, and synthesis and importance of DNA, RNA and proteins. Primarily for students in Agricultural and Food Sciences and four-year Biological Science programs in Science. May not be used as part of an Honours, Major, General, or Minor program in Chemistry or Microbiology. This course is also given in Microbiology as MBIO 2750. May not be held with the former CHEM 2370, CHEM 2371, CHEM 2710, the former CHEM 2780, the former CHEM 2860, the former MBIO 2370, MBIO 2371, MBIO 2750, or the former MBIO 2780. Prerequisites: one of CHEM 2730, CHEM 2700, the former CHEM 2770, the former CHEM 2860, CHEM 2361, the former CHEM 2860, MBIO 2730, MBIO 2700, the former MBIO 2770, the former MBIO 2360, or MBIO 2361.
SECTION D – RATIONALE
Provide a brief description of the change(s) and a rationale below.

☑ Responds to a recommendation in an external undergraduate program review.

The new B.Sc. General degree aims to expand the breadth of courses a student can take. CHEM 2750 will be accepted as a course in the advanced Sciences credit which can give students a glimpse of biochemistry topics.
MBIO 2750’s course description does not indicate that MBIO 2750 cannot be used for a Minor in Microbiology. We’ve removed the mentioning of Minor in Microbiology in CHEM 2750 so that it is consistent with MBIO 2750.

SECTION E – DETAILS OF PROPOSED MODIFICATION(S)

Adding registration restriction:
Indicate where registration is restricted to students in a faculty/college/school or academic program(s), including level or year of study. List the faculty/college/school and/or program(s). Indicate registration restrictions in the course description.
Faculty/college/school restrictions:

Program restrictions (e.g. Honours):

Adding / Removing Required Laboratory / Tutorial / Field Trip / Other Activity: Indicate required laboratory / tutorial / field trip / other activity in course description. (Do not use this section to indicate the course being modified already includes one of these requirements.)
The course is being modified in order to:
☐ Add a laboratory ☐ Remove a laboratory
☐ Add a tutorial ☐ Remove a tutorial
☐ Add a field trip ☐ Remove a field trip
☐ Add other activity ☐ Remove other activity
Describe the Other Activity below or use this space to seek SCCCC’s advice on whether to note an activity in the description.

Written English and Mathematics Requirements, Recommended Introductory Course List for U1: (Do not use this section to indicate the course already satisfies the M/W requirement or is on the RIC List.)
The course, as modified, will:
☐ Satisfy the W requirement and is to be added to the List of Written English Courses.*
☐ Satisfy the M requirement and is to be added to the List of Mathematics Courses.*
☐ Has been accepted for, and is to be added to the RIC List. *
☐ No longer satisfy the W requirement and is to be removed from the List of Written English Courses. *
☐ No longer satisfy the M requirement and is to be removed from the List of Mathematics Courses.*
☐ No longer satisfy and is to be removed from the RIC list. *
*Attach Request for Statement of Support Form(s) and responses received.
SECTION F – RESULTING CHANGES TO COURSES/PROGRAM(S)

See the Guidelines for instructions on how to complete this section of the form. Check all boxes that apply.

This course modification leads to changes to:

☐ other courses in your unit Submit Course Modification Forms for those courses.
☐ programs in your unit Submit Program Modification Forms.
☐ courses in other academic units Requests for Statement of Support Forms are required.
☐ program changes in other academic units Requests for Statement of Support Forms are required.
☐ Other units that use the course will be advised of changes to the course description, including content, prerequisites, corequisites, equivalent and mutually exclusive courses. Requests for Statement of Support Forms are required.

List all courses and/or programs that are affected (e.g. other courses that use the modified course as a prerequisite or corequisite; programs that use the course as a required/elective course), including those in other departments/faculties/colleges/schools. Be as specific as possible.

ANSC 2520, BIOL 3500, BIOL 3501, BIOL 4380, CHEM 2371, CHEM 2710, MBIO 2710, MBIO 2750, HNSC 3300, HNSC 3310, MBIO 2371, MBIO 3430, Animal Science; Animal Systems; B.Sc. Major/Major Co-op and B.Sc. Honours/Honours Co-op in Biological Sciences; Food Science; Human Nutritional Sciences; Interdisciplinary Health Program; Plant Biotechnology; Pre-Vet Medicine; Université de Saint-Boniface; B.Sc. General, Minor Microbiology.

SECTION G – STATEMENT OF ADDITIONAL COSTS, WORKLOAD, AND/OR SUPPLIES

See the Guidelines for instructions on how to complete this section of the form. Indicate where not applicable.

We anticipate no major change in workload of academic staff as a result of the course/calendar description change.

SECTION H – CHANGES TO PREREQUISITE, COREQUISITE, PRE- OR COREQUISITE, & EQUIVALENCY/MUTUAL EXCLUSIVITY

Include both Aurora and IMS course numbers. Indicate where a minimum letter grade, other than a "C" grade, is required for a prerequisite course, examination, or equivalency test. Indicate where concurrency is allowed. See definitions in the Guidelines.

Prerequisites: (MUST be taken before)

Adding:

Removing:
**Pre- or Corequisites** (MUST be taken either before or at the same time)

Adding:

Removing:

**Corequisites** (MUST be taken at the same time and not be a spanned course)

Adding:

Removing:

**Equivalent courses** (May NOT be held with existing or former courses with equivalent content, same credit hours, same level. Can be used to meet same program requirements.)

Adding:

Removing:

**Mutually exclusive courses** (May NOT be held with existing or former courses with significant content overlap and/or different credit hours and/or different level or the same course previously offered as a topics course. Cannot be held together for credit or used to meet the same program requirement.)

Adding: Indicate title of specific topics course sections, if appropriate.

Removing:

---

**SECTION I – SUPPORTING DOCUMENTATION ATTACHED**

See the Guidelines for information on required supporting documentation. Attach documents in the following order.

☐ Course outline

☐ Library statement

☑ Request for Statement of Support Form(s) and responses received

☐ Program Modification Form(s) – included with faculty/college/school submission to SCCC

---

**SECTION J – SIGNATURES**

Department Approval: 

<table>
<thead>
<tr>
<th>Horace Luong</th>
<th>Horace Luong</th>
<th>December 14, 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type Name</td>
<td>Signature *</td>
<td>Date</td>
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Faculty/College/School Approval:

<table>
<thead>
<tr>
<th>Ben Pak Ching Li</th>
<th>1/15/2021</th>
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<td>Type Name</td>
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STATEMENT OF SUPPORT: PART A – REQUEST FOR ACTION
SCCC Fall 2020/Spring 2021

Complete Sections A through D of this form. Send a copy, together with Part B and any additional supporting documentation, to unit(s) from which you are seeking a statement of support. The completed form (Sections A through E) is to be submitted to SCCCC along with Statements of Support (Part B) received. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes.

SECTION A – UNIT REQUESTING STATEMENT OF SUPPORT

Faculty/College/School: Science
Department or Program: Chemistry (002)

SECTION B – REASON FOR REQUEST FOR SUPPORT

☐ possible curricular overlap or infringement of conflict of jurisdiction with another unit(s)
☐ possible curriculum/course changes in another unit(s) arising from proposed curriculum/course change in your unit
☐ possible impact on demand (increased or decreased) for a specific course(s) in another unit(s)
☑ other (Please elaborate below, in Section C.)

Request for assessment of course intended to satisfy:

☐ Written English    ☐ Mathematics    ☐ RIC List

Indicate the SCCA deadline your unit will meet:    ☐ Fall 2020    ☐ Spring 2021

Indicate date on which request for support – Part A sent to other unit(s): January 8, 2021
Request that a response be provided by the date indicated: January 15, 2021

SECTION C – DESCRIPTION OF PROPOSED CURRICULUM/COURSE CHANGE

Briefly describe the proposed curriculum/course change in your unit and outline the request for support. Be as specific as possible, including with respect to the potential impact on courses/curricula in the other unit(s).

- Due to proposed changes to the BSc 3-year General Program, CHEM/MBIO 2730, CHEM/MBIO 2750 and CHEM 2740 will be accepted courses in the general degree.
- To bring consistency to the course descriptions of CHEM 2730 with MBIO 2730 and CHEM 2750 with MBIO 2750, CHEM 2730 and CHEM 2750 will be permissible courses for a Minor in Microbiology
- CHEM/MBIO 2730 currently has a six credit hour BIOL courses prerequisite. We would like to expand the biology prerequisite to deem HEAL 1500 and HEAL 1502 as acceptable prerequisites.
- Since CHEM 2730 and CHEM 2750 are crosslisted as MBIO 2730 and MBIO 2750, respectively, this support form will be used in support of the course modifications of MBIO 2730 and MBIO 2750 as well.

SECTION D – UNIT(S) RECEIVING REQUEST FOR STATEMENT OF SUPPORT

List the faculties/colleges/schools/departments solicited for a statement of support.

Agriculture; Biological Sciences; Interdisciplinary Health; Microbiology; Science; Universite de Saint-Boniface

SECTION E – STATEMENT(S) OF SUPPORT RECEIVED

Attach responses received from other units to your faculty/college/school submission to SCCCC.
SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Chemistry (002)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Agricultural and Food Sciences
Department or Program: Agricultural and Food Sciences, Faculty of (07)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

The Faculty of Agricultural and Food Sciences has no objections to Chemistry adding the HEAL courses as prereq options to the BIOL requirement to take CHEM 2730, CHEM 2740 and CHEM 2750. These CHEM courses are required in several of our programs and courses as prereq and we have no concerns with the proposed changes so long as there remains adequate access/space for our students to register.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- **Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.**

No impacts. No submission is required.

SECTION J – SIGNATURES

Department Approval:  
Jitendra Paliwal  
Paliwal

Digitally signed by  
Jitendra Paliwal  
Date: 2021.01.12  
12:22:41 -06'00'

Type Name  
Signature  
Date

Faculty/College/School Approval:  
Martin Scanlon  
Scanlon

Digitally signed by Martin Scanlon  
Date: 2021.01.12  
14:33:31 -06'00'

Type Name  
Signature  
Date

*Signatures are not required for Spring 2021 submissions to SCCC.
STATEMENT OF SUPPORT: PART B – RESPONSE & ACTION REQUIRED
SCCCC Fall 2020/Spring 2021

Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Chemistry (002)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Health Sciences
Department or Program: Interdisciplinary Health Program

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

These changes may impact demand for HEAL 1500 and HEAL 1502 which are planned to be delivered by the Interdisciplinary Health Program (if they are approved by Senate). We support these changes as it will allow IHP students to access these CHEM/MBIO courses that are proposed required courses for the Bachelor of Health Sciences degree (Program Modification submitted to Spring 2021 SCCCC meeting). These changes will also increase credit transferability for UM students.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

These changes may impact demand for HEAL 1500 and HEAL 1502 which are planned to be delivered by the Interdisciplinary Health Program (if they are approved by Senate; course introductions submitted to Spring 2021 SCCC meeting). We do not anticipate any difficulty meeting demand. No changes are required to be submitted to SCCC.

SECTION J – SIGNATURES

Department Approval:  Mark Nachtigal _______________________________ January 7, 2021

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<th>Type Name</th>
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Faculty/College/School Approval:

Marie Edwards _______________________________ January 7, 2021

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*Signatures are not required for Spring 2021 submissions to SCCC.
Statement of Support: Part B – Response & Action Required
SCCC Fall 2020/Spring 2021

Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

Section F – Unit Requesting Support
Faculty/College/School: Science
Department or Program: Chemistry (002)

Section G – Unit Responding to Request
Faculty/College/School: Science
Department or Program: Microbiology (060)

Section H – Response to Request
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

The Department of Microbiology supports the proposed changes.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- **Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.**

The proposed changes are anticipated to encourage additional students to consider a minor in Microbiology.

SECTION J – SIGNATURES

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<tr>
<th>Department Approval: Richard Sparling</th>
<th>January 15, 2021</th>
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<tr>
<td>Ben Pak Ching Li</td>
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*Signatures are not required for Spring 2021 submissions to SCCC.*
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F - UNIT REQUESTING SUPPORT

Faculty/College/School: Science
Department or Program: Chemistry (002)

SECTION G - UNIT RESPONDING TO REQUEST

Faculty/College/School: Science
Department or Program: Choose one

SECTION H - RESPONSE TO REQUEST

Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

This change is part of the modification of the B.Sc. General program and therefore we support this.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- Indicate when your unit will submit corresponding changes to the SCCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCCC deadline indicated on the preceding page, in Section B.

Students will be allow to use these courses in the proposed changes to the B.Sc. General.

SECTION J – SIGNATURES

Department Approval:

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Faculty/College/School Approval:

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<th>1/15/2021</th>
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*Signatures are not required for Spring 2021 submissions to SCCCC.
STATEMENT OF SUPPORT: PART B – RESPONSE & ACTION REQUIRED
SCCCC Fall 2020/Spring 2021

Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Chemistry (002)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Université de Saint-Boniface
Department or Program: sciences, Faculte des (USB)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

There is minimal impact for the Université de Saint-Boniface.

The Université de Saint-Boniface supports of these changes:
- CHEM/MBIO 2730, CHEM/MBIO 2750 and CHEM 2740 will be accepted courses in the general degree;
- CHEM 2730/MBIO 2730 and CHEM 2750/MBIO 2750 will be permissible courses for a Minor in Microbiology;
- expand the biology prerequisite to deem HEAL 1500 and HEAL 1502 as acceptable prerequisites;
- this support form will be used in support of the course modifications of MBIO 2730 and MBIO 2750 as well;

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- **Indicate when your unit will submit corresponding changes to the SCCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCCC deadline indicated on the preceding page, in Section B.**

There are no changes needed from the Université de Saint-Boniface as we do not offer equivalent courses.

We will adjusted our BSc 3-year General Program by deleting CHEM/MBIO 2730, CHEM/MBIO 2750 and CHEM 2740 in the list of non-acceptable courses in chemistry and microbiology.

SECTION J – SIGNATURES

Department Approval:  

<table>
<thead>
<tr>
<th>Mathias Oulé</th>
<th>15 janvier 2021</th>
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Faculty/College/School Approval:

<table>
<thead>
<tr>
<th>Alexandre Brassard</th>
<th>15 janvier 2021</th>
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<td>Type Name</td>
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*Signatures are not required for Spring 2021 submissions to SCCCC.*
UNDERGRADUATE PROGRAM MODIFICATION
SCCC Fall 2020/Spring 2021

See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes.

SECTION A
Faculty/College/School: Science
Department or Program: Chemistry (002)
Program (i.e. credential and discipline): B.Sc. General - Chemistry Option A & B
Changes Take Effect: Fall 2021

SECTION B – DESCRIPTION OF PROGRAM MODIFICATION
Provide a brief description of the proposed program modification. Limit – 200 words.

The department of Chemistry is proposing to remove the "Three Year B.Sc. General - chemistry focus" and the Three Year B.Sc. general degree charts from the Chemistry section in the academic calendar.

SECTION C – RATIONALE
☑️ Responds to a recommendation in an external undergraduate program review.

Provide a brief rationale for the program modification in the space provided.

The Faculty of Science is proposing to modify the 3-year General B.Sc. Program. There will be a change of introductory course requirements as well as requiring 36 credit hours of 2000 level or higher science courses, with at least 9 credit hours at the 3000 level or higher. Students will no longer be required to take the 36 credit hours over two departments or solely from biological sciences or chemistry. Therefore the "Three year B.Sc. General - Chemistry focus" and the 3-Year General B.Sc. will no longer have a recognized focus in Chemistry.

SECTION D – ACADEMIC CALENDAR CONTENT
Attach a revised program description, including program charts and any other Academic Calendar content that would require updates to reflect course and curriculum changes. Beginning with the program description as it appears in the current Academic Calendar, clearly indicate proposed changes using strikethrough font (e.g. strikethrough) to indicate content that is to be deleted and bold font to indicate content that is to be added.
SECTION E – STATEMENT OF ADDITIONAL COSTS, WORKLOAD, AND/OR SUPPLIES

See the Guidelines for instructions on how to complete this section of the form. Indicate where not applicable.

The impact on additional costs, workload and/or supplies in the Department as a result of the program charges is expected to be minimal.

SECTION F – CONSULTATION WITH OTHER UNITS THAT MIGHT BE AFFECTED BY CHANGES

See the Guidelines for instructions on how to complete this section of the form.

☐ This program modification leads to changes in programs in other units. Requests for Statement of Support Forms are required.

In the space provided, list all programs that are affected, including those in other departments, faculties, colleges, or schools. Be as specific as possible.

SECTION G – SUPPORTING DOCUMENTATION ATTACHED

See the Guidelines for information on required supporting documentation.

☐ Executive summary (required only for significant program modifications)
☐ Transition plan (required for significant program modifications)
☐ Current and revised Academic Calendar content, including program descriptions and charts (required)
☐ SPCC Program Proposal Budget Form
☐ Request for Statement of Support Forms and responses received

SECTION H – SIGNATURES *

Department Approval: Horace Luong January 7, 2021
Type Name Date

Faculty/College/School Approval:

Ben Pak Ching Li 1/10/2021
Type Name Date

*Signatures are not required for Fall 2020 submissions to SCCCC.
As approved by 4Cs and Senate in Spring 2020

4.5.1 Department of Chemistry Program Information

Option A—Three-Year General: As prescribed with all other faculty regulations in Section 3.2, students in this program must select 18 credit hours of 2000, 3000, and (or) 4000 level courses from each of two Science areas. Subject to the Faculty requirement that the 36 credit hours in the two advanced level Science areas, at least 6 credit hours must be at the 3000/4000 level).

To satisfy the requirement in the area of Chemistry, students must select a minimum of 18 credit hours of 2000 level or higher CHEM courses, with at least 6 credit hours chosen from CHEM 2122, CHEM 2520, CHEM 2720, CHEM 3120, CHEM 3320, and CHEM 3620.

Courses not allowed for use as advanced level courses in the 3-Year General Degree Option A are: CHEM 2240, the former CHEM 2550 (ENVR 2550), CHEM 2560, CHEM 2730 (MBIO 2730), CHEM 2740, CHEM 2750 (MBIO 2750); the former CHEM 2770 (the former MBIO 2770), the former CHEM 2780 (the former MBIO 2780), CHEM 3980, CHEM 3990, CHEM 4610, CHEM 4710, CHEM 4980 and CHEM 4990.

Option B—Three-Year B.Sc. —Chemistry Focus: Students that choose this path for their three-year degree program will follow the program chart below. The 24 credit hours of introductory courses and 36 credit hours of advanced level requirements have been prescribed in such a way so that students that follow the chart can seamlessly transfer to a 4-year Chemistry Honours or Major degree program should they choose to do so after the completion of the 90 credit hours listed in the chart.

Students anticipating a transfer to either the four-year Major or Honours program at the end of their second or third year should consult with the Departmental Program Advisor before registering.

Courses not allowed for use as advanced level courses in the 3-Year General Degree Option B are: CHEM 2240, the former CHEM 2550 (ENVR 2550), CHEM 2560, CHEM 2730 (MBIO 2730), CHEM 2740, CHEM 2750 (MBIO 2750), the former CHEM 2770 (the former MBIO 2770), the former CHEM 2780 (the former MBIO 2780), CHEM 3980, CHEM 3990, CHEM 4610, CHEM 4710, CHEM 4980 and CHEM 4990.

4.5.4 Chemistry General-Degree and Minor Requirements

<table>
<thead>
<tr>
<th>YEAR 1</th>
<th>YEAR 2</th>
<th>YEAR 3</th>
<th>YEAR 4</th>
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<tbody>
<tr>
<td><strong>THREE-YEAR B.Sc. General—Chemistry Focus</strong> 90 CREDIT HOURS</td>
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<tr>
<td>CHEM 1100, CHEM 1110, CHEM 1120</td>
<td>CHEM 2100, CHEM 2300, CHEM 2510, CHEM 2600, CHEM 2700</td>
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<tr>
<td>BIOL 1020, BIOL 1030</td>
<td>15 hours of required 2000 level Chemistry courses: CHEM 2100, CHEM 2300, CHEM 2510, CHEM 2600, CHEM 2700.</td>
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<tr>
<td>MATH 1500, MATH 1700</td>
<td>21 credit hours of 2000 level or higher CHEM with a minimum of 6 credit hours chosen from the 3000 / 4000 level</td>
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<td>6 credit hours of electives to be chosen from outside the Faculty of Science</td>
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<td>15 credit hours of electives</td>
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<td></td>
<td>3 credit hours from the Faculty of Arts</td>
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<tr>
<th>PHYS 1060 (or PHYS 1020), PHYS 1070 (or PHYS 1030)</th>
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<tr>
<td>3 credit hours from the Faculty of Arts³</td>
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### THREE-YEAR GENERAL 90 CREDIT HOURS

| CHEM 1100, CHEM 1110 (C), CHEM 1120¹ | a minimum of 18 credit hours of 2000-level or higher CHEM courses⁴, which include at least 6 credit hours from CHEM 2122, CHEM 2520, CHEM 2720, CHEM 3120, CHEM 3320, and CHEM 3620. Subject to the Faculty requirement that of the 36 credit hours in the two advanced level Science areas, at least 6 credit hours must be at the 3000/4000 level. |

### MINOR

| CHEM 1100, CHEM 1110 (C), CHEM 1120¹ | Plus an additional 9 credit hours of Chemistry at the 2000 level or higher. |

### NOTES:

¹ CHEM 1122 and CHEM 1126 may be used in lieu of CHEM 1120. Note: CHEM 1122 is only available to Faculty of Engineering students.

² MATH 1230 or MATH 1510 or MATH 1520 may be taken in place of MATH 1500; MATH 1232 or MATH 1710 may be taken in place of MATH 1700; MATH 1690 may be taken in place of MATH 1500 and MATH 1700.

³ Should include the required "W" course within these 6 credit hours.

⁴ Courses not allowed for use as advanced level courses in the B. Sc. General—Chemistry Focus or the 3-Year General Degree are: CHEM 2240, the former CHEM 2550 (ENVR 2550), CHEM 2560, CHEM 2730 (MBIO 2730), CHEM 2740, CHEM 2750 (MBIO 2750), the former CHEM 2770 (the former MBIO 2770), the former CHEM 2780 (the former MBIO 2780), CHEM 3880, CHEM 3990, CHEM 4610, CHEM 4710, CHEM 4980 and CHEM 4990.

(Letters in brackets indicate minimum prerequisite standing for further study.) The number x in brackets indicates a x credit hour course—all other courses are 3 credit hours.)
SECTION A
Faculty/College/School: Science
Department or Program: Computer Science (074)
Program (i.e. credential and discipline): B.Sc. General - Computer Science Option
Changes Take Effect: Fall 2021

SECTION B – DESCRIPTION OF PROGRAM MODIFICATION
Provide a brief description of the proposed program modification. Limit – 200 words.
The department of Computer Science is proposing to remove the General program charts and description listed in the departmental section of the general calendar, in response to changes to the B.Sc. General degree.

SECTION C – RATIONALE
☐ Responds to a recommendation in an external undergraduate program review.

Provide a brief rationale for the program modification in the space provided.

To be consistent with the proposed changes to the BSc General Science program initiated by the Faculty of Science.

SECTION D – ACADEMIC CALENDAR CONTENT
Attach a revised program description, including program charts and any other Academic Calendar content that would require updates to reflect course and curriculum changes. Beginning with the program description as it appears in the current Academic Calendar, clearly indicate proposed changes using strikethrough font (e.g. strike-through) to indicate content that is to be deleted and bold font to indicate content that is to be added.
SECTION E – STATEMENT OF ADDITIONAL COSTS, WORKLOAD, AND/OR SUPPLIES

See the Guidelines for instructions on how to complete this section of the form. Indicate where not applicable.

NO additional costs, workload and supplies will be required for this change.

SECTION F – CONSULTATION WITH OTHER UNITS THAT MIGHT BE AFFECTED BY CHANGES

See the Guidelines for instructions on how to complete this section of the form.

☐ This program modification leads to changes in programs in other units. Requests for Statement of Support Forms are required.

In the space provided, list all programs that are affected, including those in other departments, faculties, colleges, or schools. Be as specific as possible.

SECTION G – SUPPORTING DOCUMENTATION ATTACHED

See the Guidelines for information on required supporting documentation. Attach documents in the following order.

☐ Executive summary (required only for significant program modifications)
☐ Transition plan (required for significant program modifications)
☐ Current and revised Academic Calendar content, including program descriptions and charts (required)
☐ SPPC Program Proposal Budget Form
☐ Request for Statement of Support Forms and responses received

SECTION H – SIGNATURES

Department Approval:  Carson Leung  Dec 22, 2020

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<th>Type Name</th>
<th>Signature *</th>
<th>Date</th>
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Faculty/College/School Approval:

Ben Pak Ching Li  1/10/2021

<table>
<thead>
<tr>
<th>Type Name</th>
<th>Signature *</th>
<th>Date</th>
</tr>
</thead>
</table>

*Signatures are not required for Spring 2021 submissions to SCCCC.
Computer Science

4.6.1 Program Information

Three-Year General

As prescribed with all other faculty regulations in Section 3.2, students in this program must select 18 credit hours of 2000, 3000, and (or) 4000 level courses from each of two Science areas. To satisfy the requirement in the area of Computer Science, students must select a minimum of 18 credit hours from the 2000, 3000, and (or) 4000 level courses offered by the department (subject to the Faculty requirement that of the 36 credit hours in the two advanced level Science areas, at least 6 credit hours must be at the 3000/4000 level).

4.6.2 Computer Science Program Charts

<table>
<thead>
<tr>
<th>THREE-YEAR GENERAL (90 CREDIT HOURS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 1010, COMP 1020</td>
</tr>
</tbody>
</table>
SECTION A – COURSE DETAILS

Faculty/College/School:  Science
Department or Program:  Mathematics (136)
Subject code:  MATH  Course number:  1018  
Long Title (maximum 90 characters):  Pre-calculus in Practice
Short Title (maximum 30 characters):  Pre-calculus
Credit Hours:  3  Grading mode:  Letter Grade  
First term offered:  Fall 2021

SECTION B – COURSE DESCRIPTION FOR ACADEMIC CALENDAR

Provide the course description, exactly as it would appear in the Academic Calendar. See the Guidelines for information on completing this section of the form, including the examples provided there.

MATH 1018 Pre-Calculus in Practice Cr. Hrs. 3
(Lab required) Essential topics in pre-calculus, with an emphasis on applications and elementary mathematical modelling in the sciences. This course is intended primarily for students who do not have credit for Pre-calculus Mathematics 40S (60%) and wish to continue in a subsequent course in Mathematics. May not be used for credit in a Mathematics Honours, Joint Honours, or Major program. Not available to students who have previously obtained credit in (grade of C or better), or are concurrently registered in any Mathematics course, with the exception of MATH 1010, MATH 1020, FA 1020, the former MATH 1190 or MATH 1191.

SECTION C – RATIONALE FOR NEW COURSE (See the Guidelines for instructions on how to complete this section of the form.)

Responds to a recommendation in an external undergraduate program review.
Provide a brief rationale for the course introduction in the space provided.

MATH 1018 is being proposed to provide an alternate pathway to most first year MATH courses for students who do not hold Pre-Calculus 40S. The course is designed to provide students with the necessary prerequisite skills appearing in Pre-Calculus 40S, but with a focus on modelling and applications. By offering MATH 1018 students will earn 3 cr. hr. for a course that is integrated into the Department course offerings. MATH 1018 provides an early remedy for students entering University wishing to explore the possibility of a Science degree. Since the course is worth 3 cr. hr., students may use the course to count towards their full/part-time status required for student aid or subsidies.
SECTION D – REGISTRATION RESTRICTIONS

Indicate where registration is restricted to students in a faculty/college/school or academic program(s), including level or year of study. List the faculty/college/school and/or programs(s). Indicate registration restrictions in the course description.

Faculty/college/school restrictions:
None.

Program restrictions (e.g. Honours):
None.

SECTION E – ADDITIONAL COURSE DETAILS

Laboratory / Tutorial / Field Trip Requirement: Indicate laboratory / tutorial / field trip requirement in course description.

- [ ] Laboratory required
- [ ] Field trip required
- [ ] Tutorial required

Topics Courses:

- [ ] This is a topics course.
- [ ] This course can be completed as a topics course multiple times under different titles. Note in course description in Section B of this form.

Written English and Mathematics Requirements, Recommended Introductory Course List for U1: Check all boxes that apply. Attach Request for Statement of Support Form(s) and responses received.

- [ ] Course satisfies Written English requirement.
- [ ] Course satisfies Mathematics requirement.
- [ ] Accepted for Recommended Introductory Course List (RIC List)

SECTION F – RESULTING CHANGES TO COURSES/PROGRAM(S)

See the Guidelines for instructions on how to complete this section of the form. Check all boxes that apply.

This course introduction leads to changes to:

- [ ] other courses in your unit. Submit a Course Modification proposal for those courses.
- [ ] programs in your unit. Submit Program Modification Forms.
- [ ] courses in other academic units. Requests for Statement of Support Forms are required.
- [ ] program changes in other academic units. Requests for Statement of Support Forms are required.

List all courses and/or programs that are affected, including those in other departments/faculties/colleges/schools. Be as specific as possible.

ASTR 1810; MSKL 0100; MATH 1080; MATH 1200; MATH 1210; MATH 1211; MATH 1220; MATH 1230; MATH 1240; MATH 1241; MATH 1300; MATH 1301; MATH 1310; MATH 1500; MATH 1501; MATH 1510, MATH 1520; MATH 1690; BIOL 1000; BIOL 1001; BIOL 1010; BIOL 1011; BIOL 1020; BIOL 1021; ENG 1430; ENG 1440; ENG 1450; ENG 1460; PHYS 1020; PHYS 1021; STAT 1000; STAT 1101; STAT 1150; CHEM 0900; CHEM 1100; CHEM 1120; CHEM 1122; CHEM 1301; COMP 1010; COMP 1020; Extended Education; U1; USB.


The corresponding MATH course modifications will be proposed in Fall 2021 SCCCC meeting.
SECTION G – STATEMENT OF ADDITIONAL COSTS, WORKLOAD, AND/OR SUPPLIES

See the Guidelines for instructions on how to complete this section of the form. Indicate where not applicable.

The introduction of this course increases the teaching workload for Mathematics. Mathematics anticipates, at a minimum, offering 3 sections (approx. 50 students/section) per year (Fall/Winter/Summer).

SECTION H – PREREQUISITE, COREQUISITE, PRE- OR COREQUISITE, & EQUIVALENCY/MUTUAL EXCLUSIVITY

List all prerequisite, corequisite, pre- or corequisite, equivalent, and mutually exclusive courses, including all applicable previous courses numbers (both Aurora and IMS course numbers). See definitions in the Guidelines.

Indicate as a letter grade where a minimum grade for a prerequisite course, examination, or equivalency test is required. A minimum grade of “C” is assumed. A different minimum grade must be stated. Indicate where concurrency is allowed.

Prerequisites: (MUST be taken before)
None

Pre- or Corequisites (MUST be taken either before or at the same time)

Corequisites (MUST be taken at the same time and not be a spanned course)

Equivalent courses (May NOT be held with existing or former courses with equivalent content, same credit hours, same level. Can be used to meet same program requirements.)

Mutually exclusive courses (May NOT be held with existing or former courses with significant content overlap and/or different credit hours and/or different level or the same course previously offered as a topics course. Cannot be held together for credit or used to meet the same program requirement.)

any Mathematics course completed (C or better) or registered for, except with the exception of MATH 1010, 136.101, MATH 1020, 136.102, FA 1020, 054.102, MATH 1190, 136.119 or MATH 1191.
SECTION I – SUPPORTING DOCUMENTATION ATTACHED

See the Guidelines for information on required supporting documentation.

- Course outline (required)
- Library statement (normally required)
- Request for Statement of Support Forms and responses received
- Program Modification Form(s) – included with faculty/college/school submission to SCCCC

SECTION J – SIGNATURES*

Department Approval:  Derek Krepski 12 Nov 2020
Type Name Date

Faculty/College/School Approval:

Ben Pak Ching Li 1/12/2021
Type Name Date

*Signatures are not required for Fall 2020 Submissions to SCCCC.
Outline - MATH 1018
Pre-Calculus in Practice

Calendar Description:
(Lab required) Essential topics in pre-calculus, with an emphasis on applications and elementary mathematical modelling in the sciences. This course is intended primarily for students who do not have credit for Pre-calculus Mathematics 40S (60%) and wish to continue in a subsequent course in Mathematics. May not be used for credit in a Mathematics Honours, Joint Honours, or Major program. Not available to students who have previously obtained credit in (grade of C or better), or are concurrently registered in any Mathematics course, with the exception of MATH 1010, MATH 1020, FA 1020, the former MATH 1190 or MATH 1191.

Course Objectives:
This course has two objectives. First, to teach students basic skills in developing and analysing a model using only pre-calculus methods. Second, to teach and reinforce pre-calculus skills to a level for which students can continue into a calculus course.

The expected outcomes are that the students will leave the course with a firm grasp of pre-calculus topics, while being able to use their skills in those topics to develop and solve mathematics in the real world. The pre-calculus skills will be partially learned through self-study, together with learning, practice and skill development in the tutorials. The modelling applications will be taught in class.

This class will meet 2.5 hours per week, with two additional 75min labs per week.

Pre-Calculus Topics (done in lab and self study):

- Basic Concepts (3 weeks): Factoring, Simplifying rational and radical expressions, solving equations and inequalities, distance and slope, lines
- Functions (3 weeks): Relations and functions, transformations, compositions, inverses, rational functions, graphs of polynomials and rationals
- Systems of Equations (1 week): Solving by graphing, substitution and elimination
- Exponents and Logarithms (2.5 weeks): Exponential functions, properties, base e, logarithms and their properties
- Trigonometry (2.5 weeks): Angles and their measures, right triangles, unit circle, special values, identities, solving trigonometric equations

Modelling Topics (done in class):
Topics in general are to be taken to demonstrate real world applications involving the pre-calculus topics covered in the lab. While some review of the pre-calculus topics may happen in class, most of the time will be involved in the applications. Topics may be taken from the list below and can evolve over time.

- Basic Concepts (3 weeks): linear programming, supply/demand, interest rates
- Functions (3 weeks): What functions work best for which application
• Systems of Equations (1 week): Finding equilibrium in supply/demand curves.

• Exponents and Logarithms (2.5 weeks): compounded interest, growth decay curves and other biology applications, logarithmic curves.

• Trigonometry (2.5 weeks): periodic functions, time, temperature, climate

Textbook:
The Math Skills textbook for the pre-calculus topics. It also covers some of the possible applications.

Modelling resources will be made/tailored by faculty in the department.

Evaluation of Student Performance:
Weekly Projects
Term Tests
Modelling Final Exam
Pre-Calculus Quizzes
Pre-Calculus Midterm (In lab)
Pre-Calculus Final Examination

20% Usually group work
20% two tests, written in class
15% 2 hours - scheduled by registrar’s office
10% written in lab
15% written in lab
20% 2 parts. 60 minutes each, to be written in the last two tutorials

<table>
<thead>
<tr>
<th>Grade</th>
<th>A+</th>
<th>A</th>
<th>B+</th>
<th>B</th>
<th>C+</th>
<th>C</th>
<th>D</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>92-100</td>
<td>86-91</td>
<td>80-85</td>
<td>72-79</td>
<td>65-71</td>
<td>60-64</td>
<td>55-59</td>
<td>less than 55</td>
</tr>
</tbody>
</table>

Students must get at least 60% on the pre-calculus final exam to get a mark of C+ in the course. Otherwise, the maximum mark is C.

Notes:
• This course is intended for students who want to obtain the pre-requisite for calculus and linear algebra courses while learning some of the applications.

• This course is not intended for students who have at least 60% in pre-calculus 40S or its equivalences.

• Student who get a C+ or higher will be allowed to use this as an equivalence to Pre-Calc 40S.

• This course may not be used in a mathematics program.
Grade 12 Pre-Calculus Mathematics (40S) is designed for students who intend to study calculus and related mathematics as part of post-secondary education. It builds on the topics studied in Grade 11 Pre-Calculus Mathematics and provides background knowledge and skills for the study of calculus in post-secondary institutions.

The course comprises a high-level study of theoretical mathematics with an emphasis on problem solving and mental mathematics. The topics include study of transformations of functions, trigonometric functions, exponential functions, logarithmic functions, polynomial functions, radical functions, rational functions, and the binomial theorem.

Assessment of Grade 12 Pre-Calculus Mathematics should be a balance of assessment for learning, assessment as learning, and assessment of learning. Assessment tools used in Grade 12 Pre-Calculus Mathematics should be varied and may include observation, homework, learning conversations or interviews, summative unit essays, demonstrations, presentations, performance tasks, learning logs, projects, investigations, reflective journals, portfolios, quizzes, tests, and examinations. An appropriately prepared portfolio requires a consistent effort throughout the school term and a commitment to completing quality work on a daily basis.

The learning outcomes are divided into three topics: Trigonometry; Relations and Functions; and Permutations, Combinations, and Binomial Theorem. For instructional purposes, the learning outcomes could be arranged into units. Learning outcomes from different topics could be taught in the same unit. Some learning outcomes may fit into multiple units and parts of the learning outcome could be taught in one unit while the remaining parts can be taught later. Two possible sequences of the learning outcomes into units with suggested time allotments follow. The suggested times include time for instruction and assessment. These are not the only possibilities but will provide some direction for teachers for their first time through the course.

Regardless of the organization of the learning outcomes into units, students should constantly be looking for and be given opportunities to see connections between the various outcomes in Grade 12 Pre-Calculus Mathematics.
<table>
<thead>
<tr>
<th><strong>Possibility 1</strong></th>
<th><strong>Possibility 2</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit</strong></td>
<td><strong>Unit</strong></td>
</tr>
<tr>
<td>Transformations of Functions</td>
<td>Functions</td>
</tr>
<tr>
<td>R1, R2, R3, R4, R5, R6</td>
<td>R11, R12, R13, R14</td>
</tr>
<tr>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Trigonometric Functions</td>
<td>R11, R12, R13, R14</td>
</tr>
<tr>
<td>T1, T2, T3, T4</td>
<td>25</td>
</tr>
<tr>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>Binomial Theorem</td>
<td>Trigonometric Functions</td>
</tr>
<tr>
<td>P1, P2, P3, P4</td>
<td>R1, R2, R3, R4, R5, R6</td>
</tr>
<tr>
<td>12</td>
<td>25</td>
</tr>
<tr>
<td>Polynomial Functions</td>
<td>Permutations and Combinations</td>
</tr>
<tr>
<td>R11, R12</td>
<td>P1, P2, P3</td>
</tr>
<tr>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>Trigonometric Equations and Identities</td>
<td>Exponents and Logarithms</td>
</tr>
<tr>
<td>T3, T6</td>
<td>R7, R8, R9, R10</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Exponents and Logarithms</td>
<td>Trigonometric Identities</td>
</tr>
<tr>
<td>R7, R8, R9, R10</td>
<td>T6</td>
</tr>
<tr>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Radicals and Rationals</td>
<td>Binomial Theorem</td>
</tr>
<tr>
<td>R13, R14</td>
<td>P4</td>
</tr>
<tr>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>Total</strong></td>
</tr>
<tr>
<td>110</td>
<td>110</td>
</tr>
<tr>
<td>Specific Learning Outcomes</td>
<td>General Learning Outcome: Develop trigonometric reasoning.</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>------------------------------------------------------------</td>
</tr>
<tr>
<td>Demonstrate an understanding of angles</td>
<td>The following set of indicators may be used to determine</td>
</tr>
<tr>
<td>in standard position, expressed in</td>
<td>whether students have met the corresponding specific</td>
</tr>
<tr>
<td>degrees and radians.</td>
<td>learning outcome.</td>
</tr>
</tbody>
</table>

- Sketch, in standard position, an angle (positive or negative) when the measure is given in degrees.
- Describe the relationship among different systems of angle measurement, with emphasis on radians and degrees.
- Sketch, in standard position, an angle with a measure of 1 radian.
- Sketch, in standard position, an angle with a measure expressed in the form $k\pi$ radians, where $k \in \mathbb{Q}$.
- Express the measure of an angle in radians (exact value or decimal approximation), given its measure in degrees.
- Express the measure of an angle in degrees, given its measure in radians (exact value or decimal approximation).
- Determine the measures, in degrees or radians, of all angles in a given domain that are coterminal with an angle in standard position.
- Determine the general form of the measures, in degrees or radians, of all angles that are coterminal with an angle in standard position.
- Explain the relationship between the radian measure of an angle in standard position and the length of the arc cut on a circle of radius $r$, and solve a problem based upon that relationship.
Grade 12 Pre-Calculus Mathematics

<table>
<thead>
<tr>
<th>Strand:</th>
<th>General Learning Outcome:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trigonometry (continued)</td>
<td>Develop trigonometric reasoning.</td>
</tr>
</tbody>
</table>

Specific Learning Outcomes

It is expected that students will:

<table>
<thead>
<tr>
<th>Achievement Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>The following set of indicators may be used to determine whether students have met the corresponding specific learning outcome.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>12PT.2.</th>
<th>Develop and apply the equation of the unit circle.</th>
</tr>
</thead>
<tbody>
<tr>
<td>[CN, R, V]</td>
<td>Derive the equation of the unit circle from the Pythagorean theorem.</td>
</tr>
<tr>
<td></td>
<td>Describe the six trigonometric ratios, using a point P(x, y) that is the intersection of the terminal arm of an angle and the unit circle.</td>
</tr>
<tr>
<td></td>
<td>Generalize the equation of a circle with centre (0, 0) and radius r.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>12PT.3.</th>
<th>Solve problems, using the six trigonometric ratios for angles expressed in radians and degrees.</th>
</tr>
</thead>
<tbody>
<tr>
<td>[C, ME, PS, R, T, V]</td>
<td>Determine, with technology, the approximate value of a trigonometric ratio for any angle with a measure expressed in either degrees or radians.</td>
</tr>
<tr>
<td></td>
<td>Determine, using the unit circle or reference triangle, the exact value of a trigonometric ratio for angles expressed in degrees that are multiples of 0°, 30°, 45°, 60°, or 90°, or for angles expressed in radians that are multiples of $\frac{\pi}{6}$, $\frac{\pi}{4}$, $\frac{\pi}{3}$, or $\frac{\pi}{2}$, and explain the strategy.</td>
</tr>
<tr>
<td></td>
<td>Determine, with or without technology, the measures, in degrees or radians, of the angles in a specified domain, given the value of a trigonometric ratio.</td>
</tr>
<tr>
<td></td>
<td>Explain how to determine the exact values of the six trigonometric ratios, given the coordinates of a point on the terminal arm of an angle in standard position.</td>
</tr>
<tr>
<td></td>
<td>Determine the measures of the angles in a specified domain in degrees or radians, given a point on the terminal arm of an angle in standard position.</td>
</tr>
<tr>
<td></td>
<td>Determine the exact values of the other trigonometric ratios, given the value of one trigonometric ratio in a specified domain.</td>
</tr>
<tr>
<td></td>
<td>Sketch a diagram to represent a problem that involves trigonometric ratios.</td>
</tr>
<tr>
<td></td>
<td>Solve a problem, using trigonometric ratios.</td>
</tr>
</tbody>
</table>
## Grade 12 Pre-Calculus Mathematics

<table>
<thead>
<tr>
<th>Strand:</th>
<th>Trigonometry (continued)</th>
<th>General Learning Outcome:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific Learning Outcomes</td>
<td></td>
<td>Develop trigonometric reasoning.</td>
</tr>
<tr>
<td>It is expected that students will:</td>
<td></td>
<td>Achievement Indicators</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The following set of indicators may be used to determine whether students have met the corresponding specific learning outcome.</td>
</tr>
</tbody>
</table>

### 12PT.4.

Graph and analyze the trigonometric functions sine, cosine, and tangent to solve problems.

[C, CN, PS, T, V]

- Sketch, with or without technology, the graph of $y = \sin x$, $y = \cos x$, or $y = \tan x$.
- Determine the characteristics (amplitude, asymptotes, domain, period, range, and zeros) of the graph of $y = \sin x$, $y = \cos x$, or $y = \tan x$.
- Determine how varying the value of $a$ affects the graphs of $y = a \sin x$ or $y = a \cos x$.
- Determine how varying the value of $d$ affects the graphs of $y = \sin x + d$ or $y = \cos x + d$.
- Determine how varying the value of $c$ affects the graphs of $y = \sin (x-c)$ or $y = \cos (x-c)$.
- Determine how varying the value of $b$ affects the graphs of $y = \sin bx$ or $y = \cos bx$.
- Sketch, without technology, graphs of the form $y = a \sin b(x-c) + d$ or $y = a \cos b(x-c) + d$, using transformations, and explain the strategies.
- Determine the characteristics (amplitude, asymptotes, domain, period, phase shift, range, and zeros) of the graph of a trigonometric function of the form $y = a \sin (b(x-c)) + d$ or $y = a \cos (b(x-c)) + d$.
- Determine the values of $a$, $b$, $c$, and $d$ for functions of the form $y = a \sin b(x-c) + d$ or $y = a \cos b(x-c) + d$ that correspond to a graph, and write the equation of the function.
- Determine a trigonometric function that models a context to solve a problem.
- Explain how the characteristics of the graph of a trigonometric function relate to the conditions in a problem context.
- Solve a problem by analyzing the graph of a trigonometric function.
### Grade 12 Pre-Calculus Mathematics

**Strand:** Trigonometry (continued)

**Specific Learning Outcomes**

It is expected that students will:

<table>
<thead>
<tr>
<th>Objective</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>12PT.5</td>
<td>Solve, algebraically and graphically, first- and second-degree trigonometric equations with the domain expressed in degrees and radians.</td>
</tr>
<tr>
<td></td>
<td>[C, CN, PS, R, T, V]</td>
</tr>
<tr>
<td>Students should be able to solve first-degree sine, cosine, and tangent double-angle trigonometric equations.</td>
<td></td>
</tr>
</tbody>
</table>

**General Learning Outcome:**

Develop trigonometric reasoning.

**Achievement Indicators**

The following set of indicators may be used to determine whether students have met the corresponding specific learning outcome.

- Verify, with or without technology, that a value is a solution to a trigonometric equation.
- Determine, algebraically, the solution of a trigonometric equation, stating the solution in exact form when possible.
- Determine, using technology, the approximate solution of a trigonometric equation in a restricted domain.
- Relate the general solution of a trigonometric equation to the zeros of the corresponding trigonometric function.
- Determine, using technology, the general solution of a trigonometric equation.
- Identify and correct errors in a solution for a trigonometric equation.
- Use identities to simplify and solve a trigonometric equation.

<table>
<thead>
<tr>
<th>Objective</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>12PT.6</td>
<td>Prove trigonometric identities, using</td>
</tr>
<tr>
<td></td>
<td>reciprocal identities</td>
</tr>
<tr>
<td></td>
<td>quotient identities</td>
</tr>
<tr>
<td></td>
<td>Pythagorean identities</td>
</tr>
<tr>
<td></td>
<td>sum or difference identities (restricted to sine, cosine, and tangent)</td>
</tr>
<tr>
<td></td>
<td>double-angle identities (restricted to sine, cosine, and tangent)</td>
</tr>
<tr>
<td>[C, R, T, V]</td>
<td></td>
</tr>
<tr>
<td>Explain the difference between a trigonometric identity and a trigonometric equation.</td>
<td></td>
</tr>
<tr>
<td>Verify a trigonometric identity numerically for a given value in either degrees or radians.</td>
<td></td>
</tr>
<tr>
<td>Explain why verifying that the two sides of a trigonometric identity are equal for given values is insufficient to conclude that the identity is valid.</td>
<td></td>
</tr>
<tr>
<td>Determine, graphically, the potential validity of a trigonometric identity, using technology.</td>
<td></td>
</tr>
<tr>
<td>Determine the non-permissible values of a trigonometric identity.</td>
<td></td>
</tr>
<tr>
<td>Prove a trigonometric identity algebraically.</td>
<td></td>
</tr>
<tr>
<td>Determine, using the sum, difference, or double-angle identities, the exact value of a trigonometric ratio.</td>
<td></td>
</tr>
<tr>
<td>Specific Learning Outcomes</td>
<td>Achievement Indicators</td>
</tr>
<tr>
<td>----------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>12PR.1. Demonstrate an understanding of operations on, and compositions of, functions. [CN, R, T, V]</td>
<td>Sketch the graph of a function that is the sum, difference, product, or quotient of two functions, given their graphs.</td>
</tr>
<tr>
<td></td>
<td>Write the equation of a function that is the sum, difference, product, or quotient of two or more functions, given their equations.</td>
</tr>
<tr>
<td></td>
<td>Determine the domain and range of a function that is the sum, difference, product, or quotient of two functions.</td>
</tr>
<tr>
<td></td>
<td>Write a function f(x) as the sum, difference, product, or quotient of two or more functions.</td>
</tr>
<tr>
<td></td>
<td>Determine the value of the composition of functions when evaluated at a point using the forms f(g(x)), f(g(x)), or g(f(x)).</td>
</tr>
<tr>
<td></td>
<td>Determine, given the equations of two functions f(x) and g(x), the equation of the composite function of the forms f(g(x)), f(g(x)), or g(f(x)), and explain any restrictions.</td>
</tr>
<tr>
<td></td>
<td>Sketch, given the equations of two functions f(x) and g(x), the graph of the composite function in the forms f(g(x)), f(g(x)), or g(f(x)).</td>
</tr>
<tr>
<td></td>
<td>Sketch the graph of the function y = f(g(x)) or y = \frac{1}{f(x)} given the graph of y = f(x), and explain the strategies used.</td>
</tr>
<tr>
<td></td>
<td>Write a function f(x) as the composition of two or more functions.</td>
</tr>
<tr>
<td></td>
<td>Write a function f(x) by combining two or more functions through operations on, or compositions of, functions.</td>
</tr>
</tbody>
</table>
Grade 12 Pre-Calculus Mathematics

<table>
<thead>
<tr>
<th>Strand: Relations and Functions (continued)</th>
<th>General Learning Outcome: Develop algebraic and graphical reasoning through the study of relations.</th>
</tr>
</thead>
</table>

**Specific Learning Outcomes**

*It is expected that students will:

12P.R.2. Demonstrate an understanding of the effects of horizontal and vertical translations on the graphs of functions and their related equations. [C, CN, R, V]

- Compare the graphs of a set of functions of the form \( y - k = f(x) \) to the graph of \( y = f(x) \), and generalize, using inductive reasoning, a rule about the effect of \( k \).
- Compare the graphs of a set of functions of the form \( y = f(x) - h \) to the graph of \( y = f(x) \), and generalize, using inductive reasoning, a rule about the effect of \( h \).
- Compare the graphs of a set of functions of the form \( y = f(x) + h \) to the graph of \( y = f(x) \), and generalize, using inductive reasoning, a rule about the effects of \( h \) and \( k \).
- Sketch the graph of \( y - k = f(x) \), \( y = f(x) - h \) or \( y - k = f(x) - h \) for values of \( h \) and \( k \), given a sketch of the function \( y = f(x) \), where the equation of \( y = f(x) \) is not given.
- Write the equation of a function whose graph is a vertical or horizontal translation of the graph of the function.
<table>
<thead>
<tr>
<th>[C]</th>
<th>Communication</th>
<th>[PS]</th>
<th>Problem Solving</th>
</tr>
</thead>
<tbody>
<tr>
<td>[CN]</td>
<td>Connections</td>
<td>[R]</td>
<td>Reasoning</td>
</tr>
<tr>
<td></td>
<td>and Estimation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[V]</td>
<td>Visualization</td>
</tr>
</tbody>
</table>

**Grade 12 Pre-Calculus Mathematics**

<table>
<thead>
<tr>
<th><strong>Strand:</strong></th>
<th><strong>General Learning Outcome:</strong></th>
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</thead>
<tbody>
<tr>
<td>Relations and Functions (continued)</td>
<td>Develop algebraic and graphical reasoning through the study of relations.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Specific Learning Outcomes</strong></th>
<th><strong>Achievement Indicators</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>It is expected that students will:</td>
<td>The following set of indicators may be used to determine whether students have met the corresponding specific learning outcome.</td>
</tr>
</tbody>
</table>

12PR.3. Demonstrate an understanding of the effects of horizontal and vertical compressions and stretches on the graphs of functions and their related equations.  
[C, CN, R, V]  
A compression by a factor of \( a \) is the same as a stretch by a factor of \( \frac{1}{a} \).  
- Compare the graphs of a set of functions of the form \( y = af(x) \) to the graph of \( y = f(x) \), and generalize, using inductive reasoning, a rule about the effect of \( a \).  
- Compare the graphs of a set of functions of the form \( y = f(bx) \) to the graph of \( y = f(x) \), and generalize, using inductive reasoning, a rule about the effect of \( b \).  
- Compare the graphs of a set of functions of the form \( y = af(bx) \) to the graph of \( y = f(x) \), and generalize, using inductive reasoning, a rule about the effects of \( a \) and \( b \).  
- Sketch the graph of \( y = af(bx) \), \( y = f(bx) \), or \( y = af(bx) \) for values of \( a \) and \( b \), given a sketch of the function \( y = f(x) \), where the equation of \( y = f(x) \) is not given.  
- Write the equation of a function, given its graph, which is a vertical or horizontal compression or stretch of the graph of the function \( y = f(x) \).  

12PR.4. Apply translations, compressions, and stretches to the graphs and equations of functions.  
[C, CN, R, V]  
- Sketch the graph of the function \( y - k = af(b(x - h)) \) for values of \( a \), \( b \), \( h \), and \( k \), given the graph of the function \( y = f(x) \), where the equation of \( y = f(x) \) is not given.  
- Write the equation of a function, given its graph which is a translation, compression, or stretch of the graph of the function \( y = f(x) \).
## Specific Learning Outcomes
It is expected that students will

### 12P.R.5.
Demonstrate an understanding of the effects of reflections on the graphs of functions and their related equations, including reflections through the
- x-axis
- y-axis
- line \( y = x \)
[C, CN, R, V]

#### Achievement Indicators
- Generalize the relationship between the coordinates of an ordered pair and the coordinates of the corresponding ordered pair that results from a reflection through the x-axis, the y-axis, or the line \( y = x \).
- Sketch the reflection of the graph of a function \( y = f(x) \) through the x-axis, the y-axis, or the line \( y = x \), given the graph of the function \( y = f(x) \), where the equation of \( y = f(x) \) is not given.
- Generalize, using inductive reasoning, and explain rules for the reflection of the graph of the function \( y = f(x) \) through the x-axis, the y-axis, or the line \( y = x \).
- Sketch the graphs of the functions \( y = -f(x), y = f(-x), \) and \( y = f^{-1}(x) \) given the graph of the function \( y = f(x) \), where the equation of \( y = f(x) \) is not given.
- Write the equation of a function, given its graph, which is a reflection of the graph of the function through the x-axis, the y-axis, or the line \( y = x \).

### 12P.R.6.
Demonstrate an understanding of inverses of relations.
[C, CN, R, V]

#### Achievement Indicators
- Explain how the graph of the line \( y = x \) can be used to sketch the inverse of a relation.
- Explain how the transformation \( (x, y) \rightarrow (y, x) \) can be used to sketch the inverse of a relation.
- Sketch the graph of the inverse relation, given the graph of a relation.
- Determine whether a relation and its inverse are functions.
- Determine restrictions on the domain of a function in order for its inverse to be a function.
- Determine the equation and sketch the graph of the inverse relation, given the equation of a linear or quadratic relation.
- Explain the relationship between the domains and ranges of a relation and its inverse.
- Determine, algebraically or graphically, whether two functions are inverses of each other.
## Grade 12 Pre-Calculus Mathematics

<table>
<thead>
<tr>
<th>Strand:</th>
<th>Relations and Functions (continued)</th>
<th>General Learning Outcome: Develop algebraic and graphical reasoning through the study of relations.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific Learning Outcomes</td>
<td>It is expected that students will:</td>
<td>Achievement Indicators The following set of indicators may be used to determine whether students have met the corresponding specific learning outcome.</td>
</tr>
</tbody>
</table>
| 12P.R.7. | Demonstrate an understanding of logarithms. [C, CN, ME, R] | ■ Explain the relationship between logarithms and exponents.  
■ Express a logarithmic expression as an exponential expression, and vice versa.  
■ Determine, without technology, the exact value of a logarithm.  
■ Estimate the value of a logarithm, using benchmarks, and explain the reasoning. |
■ Prove each law of logarithms.  
■ Determine, using the laws of logarithms, an equivalent expression for a logarithmic expression.  
■ Determine, with technology, the approximate value of a logarithmic expression. |
Grade 12 Pre-Calculus Mathematics

<table>
<thead>
<tr>
<th>Specific Learning Outcomes</th>
<th>General Learning Outcome</th>
</tr>
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<tbody>
<tr>
<td>Relations and Functions (continued)</td>
<td>Develop algebraic and graphical reasoning through the study of relations.</td>
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</tbody>
</table>

12PR.9. Graph and analyze exponential and logarithmic functions. [C, CN, T, V]

It is intended that students will be able to work with logarithms of any base, \( b > 1 \), including base \( e \).

- Sketch, with or without technology, a graph of an exponential function of the form \( y = a^x \), \( a > 0 \).
- Identify the characteristics of the graph of an exponential function of the form \( y = a^x \), \( a > 0 \), including the domain, range, horizontal asymptote, and intercepts, and explain the significance of the horizontal asymptote.
- Sketch the graph of an exponential function by applying a set of transformations to the graph of \( y = a^x \), \( a > 0 \), and state the characteristics of the graph.
- Sketch, with or without technology, the graph of a logarithmic function of the form \( y = \log_b x \), \( b > 1 \).
- Identify the characteristics of the graph of a logarithmic function of the form \( y = \log_b x \), \( x, b > 1 \), including the domain, range, vertical asymptote, and intercepts, and explain the significance of the vertical asymptote.
- Sketch the graph of a logarithmic function by applying a set of transformations to the graph of \( y = \log_b x \), \( b > 1 \), and state the characteristics of the graph.
- Demonstrate, graphically, that a logarithmic function and an exponential function with the same base are inverses of each other.

12PR.10. Solve problems that involve exponential and logarithmic equations. [C, CN, PS, R]

- Determine the solution of an exponential equation in which the bases are powers of one another.
- Determine the solution of an exponential equation in which the bases are not powers of one another, using a variety of strategies.
- Determine the solution of a logarithmic equation, and verify the solution.
- Explain why a value obtained in solving a logarithmic equation may be extraneous.
- Solve a problem that involves exponential growth or decay.
- Solve a problem that involves the application of exponential equations to loans, mortgages, or investments.
- Solve a problem that involves logarithmic scales, such as the Richter scale or the pH scale.
- Solve a problem by modelling a situation with an exponential or a logarithmic equation.
<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>Strand:</strong> Relations and Functions (continued)</td>
</tr>
<tr>
<td><strong>General Learning Outcome:</strong> Develop algebraic and graphical reasoning through the study of relations.</td>
</tr>
<tr>
<td><strong>Specific Learning Outcomes</strong></td>
</tr>
<tr>
<td>It is expected that students will:</td>
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<tr>
<td>12PR.11. Demonstrate an understanding of factoring polynomials of degree greater than 2 (limited to polynomials of degree ≤ 5 with integral coefficients). [C, CN, ME]</td>
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<tr>
<td>12PR.12. Graph and analyze polynomial functions (limited to polynomial functions of degree ≤ 5). [C, CN, PS, T, V]</td>
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Grade 12 Pre-Calculus Mathematics

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<tr>
<th>Strand: Relations and Functions (continued)</th>
<th>General Learning Outcome: Develop algebraic and graphical reasoning through the study of relations.</th>
</tr>
</thead>
</table>

Specific Learning Outcomes
It is expected that students will

12.PR.13. Graph and analyze radical functions (limited to functions involving one radical).
[C, CN, R, T, V]
- Sketch the graph of the function \( y = \sqrt{x} \), using a table of values, and state the domain and range.
- Sketch the graph of the function \( y - k = a\sqrt{x - h} \) by applying transformations to the graph of the function \( y = \sqrt{x} \), and state the domain and range.
- Sketch the graph of the function \( y = \sqrt{f(x)} \), given the graph of the function \( y = f(x) \), and explain the strategies used.
- Compare the domain and range of the function \( y = \sqrt{f(x)} \), to the domain and range of the function \( y = f(x) \), and explain why their domains and ranges may differ.
- Describe the relationship between the roots of a radical equation and the \( x \)-intercepts of the graph of the corresponding radical function.
- Determine, graphically, an approximate solution of a radical equation.

12.PR.14. Graph and analyze rational functions (limited to numerators and denominators that are monomials, binomials, or trinomials).
[C, CN, R, T, V]
- Graph, with or without technology, a rational function.
- Analyze the graphs of a set of rational functions to identify common characteristics.
- Explain the behaviour of the graph of a rational function for values of the variable near a non-permissible value.
- Determine if the graph of a rational function will have an asymptote or a point of discontinuity (hole) for a non-permissible value.
- Match a set of rational functions to their graphs, and explain the reasoning.
- Describe the relationship between the roots of a rational equation and the \( x \)-intercepts of the graph of the corresponding rational function.
- Determine, graphically, an approximate solution of a rational equation.
## Grade 12 Pre-Calculus Mathematics

### Strands:
- Permutations, Combinations and Binomial Theorem

### General Learning Outcome:
Develop algebraic and numeric reasoning that involves combinatorics.

### Specific Learning Outcomes
It is expected that students will:

12P.1 Apply the fundamental counting principle to solve problems.
   - [C, CN, PS, R, V]
   - Count the total number of items in the sample space, using graphic organizers such as lists and tree diagrams.
   - Explain, using examples, why the total number of items is found by multiplying rather than adding the number of ways the individual choices can be made.
   - Solve a simple counting problem by applying the fundamental counting principle.

12P.2 Determine the number of permutations of $n$ elements taken $r$ at a time to solve problems.
   - [C, PS, R, V]
   - Count, using graphic organizers such as lists and tree diagrams, the number of ways of arranging the elements of a set in a row.
   - Determine, in factorial notation, the number of permutations of $n$ different elements taken $n$ at a time to solve a problem.
   - Determine, using a variety of strategies, the number of permutations of $n$ different elements taken $r$ at a time to solve a problem.
   - Explain why $n$ must be greater than or equal to $r$ in the notation $P_n^r$.
   - Solve an equation that involves $P_n^r$ notation.
   - Explain, using examples, the effect on the total number of permutations when two or more elements are identical.
Grade 12 Pre-Calculus Mathematics

<table>
<thead>
<tr>
<th>Strand:</th>
<th>General Learning Outcome:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permutations, Combinations and Binomial Theorem (continued)</td>
<td>Develop algebraic and numeric reasoning that involves combinatorics</td>
</tr>
</tbody>
</table>

**Specific Learning Outcomes**

It is expected that students will:

| 12P.P.3. Determine the number of combinations of n different elements taken r at a time to solve problems. | Achievement Indicators |
| [C, PS, R, VI] | The following set of indicators may be used to determine whether students have met the corresponding specific learning outcome. |

- Explain, using examples, the difference between a permutation and a combination.
- Determine the number of combinations of n different elements taken r at a time to solve a problem.
- Explain why n must be greater than or equal to r in the notation \( \binom{n}{r} \).
- Explain, using examples, why \( \binom{n}{r} = \binom{n}{n-r} \).
- Solve an equation that involves \( \binom{n}{r} \) notation.
Grade 12 Pre-Calculus Mathematics

Permutations, Combinations and Binomial Theorem (continued)

<table>
<thead>
<tr>
<th>Specific Learning Outcomes</th>
<th>General Learning Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>12.P.4.</strong> Expand powers of a binomial in a variety of ways, including using the binomial theorem (restricted to exponents that are natural numbers).</td>
<td>Develop algebraic and numeric reasoning that involves combinatorics.</td>
</tr>
</tbody>
</table>

**It is expected that students will:**

- Explain the patterns found in the expanded form of \((x + y)^n\), where \(n \leq 4\), by multiplying \(n\) factors of \((x + y)\).
- Explain how to determine the subsequent row in Pascal's triangle, given any row.
- Relate the coefficients of the terms in the expansion of \((x + y)^n\) to the \((n + 1)^{th}\) row in Pascal's triangle.
- Explain, using examples, how the coefficients of the terms in the expansion of \((x + y)^n\) are determined by combinations.
- Expand, using the binomial theorem \((x + y)^n\).
- Determine a specific term in the expansion of \((x + y)^n\).
University of Manitoba Libraries
Statement for Undergraduate Curriculum Change

Faculty
Department
Course #
Course Name

Science
Mathematics
MATH 1018
Pre-Calculus in Practice

The Libraries' collection can support this new course, as it was described in the documents provided.

It is not expected that this proposed change will affect the Libraries' ability to continue to provide services such as research and teaching support, reference assistance, document delivery, and the technical infrastructure which allows the discovery and delivery of the Libraries' resources and services.

Grace Romund
Mathematics Liaison Librarian

Vickie Albrecht
Head, Sciences Division

Kristen Kruse
Coordinator, Collections Management

Lisa Hanson O'Hara
Vice Provost (Libraries) & University Librarian

November 19, 2020
Date
STATEMENT OF SUPPORT: PART A – REQUEST FOR ACTION
SCCCC Fall 2020/Spring 2021

Complete Sections A through D of this form. Send a copy, together with Part B and any additional supporting documentation, to unit(s) from which you are seeking a statement of support. The completed form (Sections A through E) is to be submitted to SCCC along with Statements of Support (Part B) received. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes.

SECTION A – UNIT REQUESTING STATEMENT OF SUPPORT

Faculty/College/School: Science
Department or Program: Mathematics (136)

SECTION B – REASON FOR REQUEST FOR SUPPORT

☐ possible curricular overlap or infringement or conflict of jurisdiction with another unit(s)
☐ possible curriculum/course changes in another unit(s) arising from proposed curriculum/course change in your unit
☐ possible impact on demand (increased or decreased) for a specific course(s) in another unit(s)
☐ other (Please elaborate below, in Section C.)

Request for assessment of course intended to satisfy:

☐ Written English ☐ Mathematics ☑ RIC List

Indicate the SCCC deadline your unit will meet: ☑ Fall 2020 ☑ Spring 2021

Indicate date on which request for support – Part A sent to other unit(s): 12 Nov 2020

Request that a response be provided by the date indicated: 27 Nov 2020

SECTION C – DESCRIPTION OF PROPOSED CURRICULUM/COURSE CHANGE

Briefly describe the proposed curriculum/course change in your unit and outline the request for support. Be as specific as possible, including with respect to the potential impact on courses/curricula in the other unit(s).

Mathematics is proposing a new course, MATH 1018 to provide an alternate pathway to most first year MATH courses for students who do not hold the appropriate Pre-Calculus 40S prerequisite. The course is designed to provide students with the necessary prerequisite skills appearing in Pre-Calculus 40S, but with a focus on modelling and applications.

Note that affected courses (those which require Pre-Calculus 40S as a prerequisite) in MATH will be modified for SCCC meeting in Fall 2021.

SECTION D – UNIT(S) RECEIVING REQUEST FOR STATEMENT OF SUPPORT

List the faculties/colleges/schools/departments solicited for a statement of support.

Biological Sciences; Chemistry; Computer Science; Physics and Astronomy; Faculty of Arts; Economics; Faculty of Engineering; Extended Education; U1; Université St Boniface; Statistics

SECTION E – STATEMENT(S) OF SUPPORT RECEIVED

Attach responses received from other units to your faculty/college/school submission to SCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Mathematics (136)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Science
Department or Program: Biological Sciences (071)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCCC should be aware of.

The Department of Biological Sciences is in support of the creation of this new course.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- Indicate when your unit will submit corresponding changes to the SCCC (e.g., Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

This new course should have minimal to no impact on our program offerings.

SECTION J – SIGNATURES*

Department Approval: Kevin G-E. Scott 14 November 2020
                        Type Name                        Date

Faculty/College/School Approval:

Ben Pak Ching Li 1/12/2021
                        Type Name                        Date

*Signatures are not required for Fall 2020 submissions to SCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Mathematics (136)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Science
Department or Program: Chemistry (002)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

The introduction of MATH 1018 will provide an additional MATH pathway for students to enroll in CHEM 0900, CHEM 1100, CHEM 1120 and CHEM 1122.

The Department of Chemistry supports the introduction of MATH 1018.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support.
- Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

CHEM 0900
CHEM 1100
CHEM 1120
CHEM 1122

The Chemistry courses listed above will be adding MATH 1018 as a prerequisite option.

The course changes will be proposed in the Fall 2021 SCCC meeting.

SECTION J – SIGNATURES*

Department Approval:  Horace Luong  
Type Name  
November 14, 2020  
Date

Faculty/College/School Approval:

Ben Pak Ching Li  
Type Name  
1/12/2021  
Date

*Signatures are not required for Fall 2020 submissions to SCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the *Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes*. The completed form (Part B) is to be returned to the unit requesting support.

**SECTION F – UNIT REQUESTING SUPPORT**

Faculty/College/School: Science  
Department or Program: Mathematics (136)

**SECTION G – UNIT RESPONDING TO REQUEST**

Faculty/College/School: Science  
Department or Program: Computer Science (074)

**SECTION H – RESPONSE TO REQUEST**

Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

Computer Science supports this course change (i.e., introduction of MATH 1018) as this proposed course introduction may have no/minimal impact to COMP.

*See next page.*
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- **Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.**

As the proposed changes may have no/minimal impact to COMP and its programs (e.g., BSc(Hons) in MATH-COMP; BSc in Applied Math with option in COMP), no corresponding changes are planned to submit to the SCCC.

SECTION J – SIGNATURES*

Department Approval:  
Carson Leung  
Type Name  
Nov 12 2020  
Date

Faculty/College/School Approval:  
Ben Pak Ching Li  
Type Name  
1/12/2021  
Date

*Signatures are not required for Fall 2020 submissions to SCCC.
Statement of Support: Part B – Response & Action Required

SCCCC Fall 2020/Spring 2021

Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

Section F – Unit Requesting Support

Faculty/College/School: Science
Department or Program: Mathematics (136)

Section G – Unit Responding to Request

Faculty/College/School: Science
Department or Program: Physics and Astronomy (016)

Section H – Response to Request

Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCCC should be aware of.

The Department of Physics & Astronomy supports this request and will plan to proceed with a course modification for PHYS 1020 for the SCCCC Fall 2021 meeting to include MATH 1018 as a suitable substitute for Mathematics 40S.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support.
- Indicate when your unit will submit corresponding changes to the SCCCC (e.g., Fall 2020 or Spring 2021). In most cases, this will be the SCCCC deadline indicated on the preceding page, in Section B.

We will propose a course modification for PHYS 1020 for the Fall 2021 SCCCC meeting, adding MATH 1018 to the list of prerequisites as a suitable substitute for Mathematics 405.

SECTION J – SIGNATURES*

Department Approval:  
Khodr Shamseddine  
Type Name  
November 13, 2020  
Date

Faculty/College/School Approval:

Ben Pak Ching Li  
Type Name  
1/12/2021  
Date

*Signatures are not required for Fall 2020 submissions to SCCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT

Faculty/College/School: Science
Department or Program: Mathematics (136)

SECTION G – UNIT RESPONDING TO REQUEST

Faculty/College/School: Arts [Faculty of]
Department or Program: Mathematics (136)

SECTION H – RESPONSE TO REQUEST

Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCCC should be aware of.

The Faculty of Arts offers a BA in Math.

The Faculty has no concerns with the introduction of this course. No program change is required.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

No action required.

SECTION J – SIGNATURES *

Department Approval: Heidi Marx November 24, 2020

Type Name Date

Faculty/College/School Approval:

Greg Smith 24 November 2020

Type Name Date

*Signatures are not required for Fall 2020 submissions to SCCC.
Statement of Support: Part B – Response & Action Required
SCCC Fall 2020/Spring 2021

Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Mathematics (136)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Arts [Faculty of]
Department or Program: Economics (018)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

This will have little to no impact on Economics. Economics supports Math's right to make the changes it feels are required to its program.

The Faculty of Arts asks if this proposed course will be an allowable substitution for any math courses found in the Joint MATH-ECON or Joint STATS-ECON Honours programs, or, indeed, any other programs that require or recommend first year MATH.

We also wonder what the effect with be of this course on the MSKL courses offered by Extended Education.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support.
- Indicate when your unit will submit corresponding changes to the SCCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCCC deadline indicated on the preceding page, in Section B.

See H

We will not be submitting corresponding changes to SCCCC.

The Faculty of Arts will work with the Department on any required Program Modifications, if necessary though these are not anticipated.

SECTION J – SIGNATURES*

Department Approval:  Jan Hudson  November 13, 2020
Type Name  Date

Faculty/College/School Approval:

Greg Smith  13 Nov 2020
Type Name  Date

*Signatures are not required for Fall 2020 submissions to SCCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the *Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes*. The completed form (Part B) is to be returned to the unit requesting support.

**SECTION F – UNIT REQUESTING SUPPORT**

Faculty/College/School: Science

Department or Program: Mathematics (136)

**SECTION G – UNIT RESPONDING TO REQUEST**

Faculty/College/School: Engineering

Department or Program: Engineering, Preliminary Year (130)

**SECTION H – RESPONSE TO REQUEST**

Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

The change will have no impact on our courses. Courses in the preliminary engineering program that listed Pre-Calculus 40s, MATH 0900 or MK1 0100 as pre-requisite will also list MATH 1018.

*See next page.*
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- **Indicate when your unit will submit corresponding changes to the SCCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCCC deadline indicated on the preceding page, in Section B.**

ENG 1430, ENG 1440, ENG 1450, ENG 1460 will list MATH 1018 as equivalent to Pre-Calculus 40s. Changes will be submitted to SCCCC in Spring 2021.

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SECTION J – SIGNATURES*

Department Approval:  

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Faculty/College/School Approval:

<table>
<thead>
<tr>
<th>Ahmed Shalaby</th>
<th>Nov. 17, 2020</th>
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*Signatures are not required for Fall 2020 submissions to SCCCC.
SECTION F -- UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Mathematics (136)

SECTION G -- UNIT RESPONDING TO REQUEST
Faculty/College/School: Extended Education
Department or Program: Choose one

SECTION H -- RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

No concerns
Extended Education has been in conversation with the Faculty of Science regarding the creation of degree credit preparatory science courses
We are in support of this change
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support.
- Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

MATH SKILLS (MSKL) 100 - non-degree credit preparatory course
the suite of preparatory courses offered by Extended Education are not part of a program thus the potential cancellation of these non-degree credit courses will not have extended impacts to our programming.

SECTION J – SIGNATURES*

Department Approval: NA

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Faculty/College/School Approval:

ROD LASTRA (ASSOCIATE)

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*Signatures are not required for Fall 2020 submissions to SCCC.
STATEMENT OF SUPPORT: PART B – RESPONSE & ACTION REQUIRED
SCCC Fall 2020/Spring 2021

Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Mathematics (136)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: University 1
Department or Program: Choose one

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

we are in support of this new course

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- **Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.**

SECTION J – SIGNATURES*

Department Approval:

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Faculty/College/School Approval:

<table>
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<tr>
<th>Brandy Usick</th>
<th>Jan 12 2021</th>
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*Signatures are not required for Fall 2020 submissions to SCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Mathematics (136)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Université de Saint-Boniface
Department or Program: sciences, Facultés (USB)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCCC should be aware of.

The Department of Mathematical Sciences at the University of Saint-Boniface supports the introduction of MATH 1018 at the University of Manitoba, but we do have some concern and we are still discussing whether or not we will implement the equivalent course introduction.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- **Indicate when your unit will submit corresponding changes to the SCCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCCC deadline indicated on the preceding page, in Section B.**

The prerequisite for the following courses will need to be modified to include MATH 1018 as an alternative prerequisite: ENG 1441, MATH 1081, MATH 1211, MATH 1241, MATH 1301, MATH 1501, PHYS 1021. Those changes will be submitted for the SCCCC of Spring 2022.

There might be a decreased in the number of students taking MATH 0401, MATH 1191, STAT 1001 and possibly other first year mathematics courses.

MATH 0401 might need to be replaced by a USB equivalent of MATH 1018, but further discussion will be required in our department before a decision could be made.

SECTION J – SIGNATURES*

Department Approval:  **Nicolas Bouffard**  

Type Name  

November 22, 2020  

Date

Faculty/College/School Approval:  

**Alexandre Brassard**  

Type Name  

November 23, 2020  

Date

*Signatures are not required for Fall 2020 submissions to SCCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Mathematics (136)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Science
Department or Program: Statistics (005)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCCC should be aware of.

The Department of Statistics has no concerns at this time and supports this request.

This course introduction is expected to have no measurable impact in terms of enrollments in STAT courses.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support.
- Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

The Department of Statistics will have to submit a course change for updating the calendar descriptions of STAT 1000 and STAT 1150. These submissions are expected to go forward in Fall 2021.

The creation of MATH 1018 is expected to lead to no other course/program changes for the Department.

SECTION J – SIGNATURES*

Department Approval:  Alexandre Leblanc  January 12, 2021
Type Name  Date

Faculty/College/School Approval:

Ben Pak Ching Li  1/15/2021
Type Name  Date

*Signatures are not required for Fall 2020 submissions to SCCC.
UNDERGRADUATE PROGRAM MODIFICATION
SCCC Fall 2020/Spring 2021

See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes.

SECTION A
Faculty/College/School: Science
Department or Program: Mathematics (136)
Program (i.e. credential and discipline): BSc General -- Mathematics Focus Area
Changes Take Effect: Fall 2021

SECTION B – DESCRIPTION OF PROGRAM MODIFICATION
Provide a brief description of the proposed program modification. Limit – 200 words.
The department of Mathematics, in response to proposed changes by the Faculty of Science to eliminate focus areas for the BSc General degree, proposes to remove/delete the BSc General Mathematics Program Chart in the Academic Calendar (see Section 4.9.1 and 4.9.2.7 in Academic Calendar).

SECTION C – RATIONALE
☑️ Responds to a recommendation in an external undergraduate program review.
Provide a brief rationale for the program modification in the space provided.
This is in response/support of proposed changes by the Faculty of Science, as noted in Section B.

SECTION D – ACADEMIC CALENDAR CONTENT
Attach a revised program description, including program charts and any other Academic Calendar content that would require updates to reflect course and curriculum changes. Beginning with the program description as it appears in the current Academic Calendar, clearly indicate proposed changes using strikethrough font (e.g. strikethrough) to indicate content that is to be deleted and bold font to indicate content that is to be added.
SECTION E – STATEMENT OF ADDITIONAL COSTS, WORKLOAD, AND/OR SUPPLIES

See the Guidelines for instructions on how to complete this section of the form. Indicate where not applicable.

None.

SECTION F – CONSULTATION WITH OTHER UNITS THAT MIGHT BE AFFECTED BY CHANGES

See the Guidelines for instructions on how to complete this section of the form.

☐ This program modification leads to changes in programs in other units. Requests for Statement of Support Forms are required.

In the space provided, list all programs that are affected, including those in other departments, faculties, colleges, or schools. Be as specific as possible.

Faculty of Arts.
The proposed change is a response to a proposal of the Faculty of Science. The Faculty of Arts offers a BA General Mathematics Major that is similar to BSc General with Mathematics focus area. The changes proposed to the BSc General do not necessitate changes to the BA General Math Major.

SECTION G – SUPPORTING DOCUMENTATION ATTACHED

See the Guidelines for information on required supporting documentation. Attach documents in the following order.

☐ Executive summary (required only for significant program modifications)
☐ Transition plan (required for significant program modifications)
☑ Current and revised Academic Calendar content, including program descriptions and charts (required)
☐ SPPC Program Proposal Budget Form
☑ Request for Statement of Support Forms and responses received

SECTION H – SIGNATURES

Department Approval: Derek Krepski

Digitally signed by Derek Krepski
Date: 2020-12-15
06:42:40-08:00

Type Name: Derek Krepski
Signature: 15 Dec 2020
Date

Faculty/College/School Approval:

Ben Pak Ching Li

Type Name: Ben Pak Ching Li
Signature: 1/10/2021
Date

*Signatures are not required for Spring 2021 submissions to SCCC.
4.9.1 Program Information

Three-Year General

As prescribed with all other faculty regulations in Section 3.2, students in this program must select 18 credit hours of 2000, 3000, and (or) 4000 level courses from each of two Science areas. To satisfy the requirement in the area of Mathematics, students must select a minimum of 18 credit hours of 2000, 3000, and (or) 4000 level Mathematics courses (subject to the Faculty requirement that of the 36 credit hours in the two advanced level Science areas, at least 6 credit hours must be at the 3000/4000 level).

4.9.2.7 Mathematics General-Degree and Minor Requirements

As approved by 4Cs and Senate in Fall 2020

<table>
<thead>
<tr>
<th>YEAR 1</th>
<th>YEAR 2</th>
<th>YEAR 3</th>
<th>YEAR 4</th>
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<tr>
<td>THREE YEAR GENERAL 90 CREDIT HOURS</td>
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<tr>
<td>MATH 1220, MATH 1230, MATH 1232, MATH 1240</td>
<td>18 credit hours of 2000, 3000, and (or) 4000 level Mathematics courses (subject to the Faculty requirement that of the 36 credit hours to be completed in the two advanced level Science areas, at least 6 credit hours must be at the 3000/4000 level).</td>
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MINOR

| MATH 1220, MATH 1230, MATH 1232, plus a minimum of 9 credit hours from MATH 1240 and (or) 2000 and (or) 3000 level Mathematics courses. |

NOTES:

1 MATH 1500 or MATH 1510 may be taken in place of MATH 1230; MATH 1210 (B) or MATH 1300 may be taken in place of MATH 1220; MATH 1700 or MATH 1710 may be taken in place of MATH 1232. MATH 1200 may be taken in place of MATH 1240, but these courses are not equivalent. I.e. students should note that MATH 1240 is a prerequisite to some 2nd year mathematics courses of which MATH 1200 is not a prerequisite.
STATEMENT OF SUPPORT: PART A – REQUEST FOR ACTION
SCCCC Fall 2020/Spring 2021

Complete Sections A through D of this form. Send a copy, together with Part B and any additional supporting documentation, to unit(s) from which you are seeking a statement of support. The completed form (Sections A through E) is to be submitted to SCCC along with Statements of Support (Part B) received. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes.

SECTION A – UNIT REQUESTING STATEMENT OF SUPPORT

Faculty/College/School: Science
Department or Program: Mathematics (136)

SECTION B – REASON FOR REQUEST FOR SUPPORT

☐ possible curricular overlap or infringement or conflict of jurisdiction with another unit(s)
☐ possible curriculum/course changes in another unit(s) arising from proposed curriculum/course change in your unit
☐ possible impact on demand (increased or decreased) for a specific course(s) in another unit(s)
☒ other (Please elaborate below, in Section C.)

Request for assessment of course intended to satisfy:

☐ Written English
☐ Mathematics
☐ RIC List

Indicate the SCCC deadline your unit will meet: ☒ Fall 2020

Indicate date on which request for support – Part A sent to other unit(s): 15 Dec 2020

Request that a response be provided by the date indicated: 23 Dec 2020

SECTION C – DESCRIPTION OF PROPOSED CURRICULUM/COURSE CHANGE

Briefly describe the proposed curriculum/course change in your unit and outline the request for support. Be as specific as possible, including with respect to the potential impact on courses/curricula in the other unit(s).

In response to proposed changes by the Faculty of Science to eliminate focus areas for the BSc General degree, Mathematics will remove/delete the BSc General Mathematics Program Chart in the Academic Calendar (see Section 4.9.2.7 in Academic Calendar).

SECTION D – UNIT(S) RECEIVING REQUEST FOR STATEMENT OF SUPPORT

List the faculties/colleges/schools/departments solicited for a statement of support.

Faculty of Arts.

SECTION E – STATEMENT(S) OF SUPPORT RECEIVED

Attach responses received from other units to your faculty/college/school submission to SCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Mathematics (136)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Arts [Faculty of]
Department or Program: Choose one

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

The Faculty of Arts supports this change. The Faculty of Arts offers a B.A. Math degree, but this change will have no affect on that degree program.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

No impact anticipated for the Faculty of Arts.

SECTION J – SIGNATURES*

Department Approval:

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Faculty/College/School Approval:

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*Signatures are not required for Fall 2020 submissions to SCCC.
UNIVERSITY OF MANITOBA

UNDERGRADUATE COURSE DELETIONS
SCCCC Fall 2020/Spring 2021

See the Guidelines for Completion of Undergraduate / Certificate Course and Curriculum Changes. This form can be used to delete up to 2 courses. Please complete additional forms, as required.

SECTION A

Faculty/College/School: Science
Department or Program: Microbiology (060)

SECTION B -1 – COURSE 1 TO BE DELETED

Subject code: MBIO Course No.: 4670 Credit Hours: 3 Last Term Offered: Different Term

Long Title: Applied Molecular Biology H

This course is on the Course List(s) indicated. Check all boxes that apply:

☐ Written English ☐ Mathematics ☐ RIC List

In the space provided, indicate the reason for the course deletion:

☐ Responds to a recommendation in an external undergraduate program review:

☒ The deleted course appears in the course description for other courses in your unit. A Course Modification form is required.

☐ The deleted course appears in program descriptions/charts/elective lists in your unit. A Program Modification Form is required.

A Request for Statement of Support Form is required if:

☐ The deleted course appears in the course description for courses in another unit.

☒ The deleted course appears in program descriptions/charts/elective lists in another unit.

List courses and/or programs affected (e.g. other courses that use the deleted course as a prerequisite or corequisite; programs that use the course as a required/elective course). Be as specific as possible.

The programs in Biochemistry and in Genetics use this as one of their options courses. The USB offers a course (MBIO 4581) in its Microbiology-Biochemistry Major that is 'not to be held with' MBIO 4670. The deleted course has not been offered since 2015 and has been substituted in the Microbiology program with MBIO 4672.
SECTION B -2 – COURSE 2 TO BE DELETED

Subject code: __________ Course No.: __________ Credit Hours: __________ Last Term Offered: Summer 2021

Long Title:

This course is on the Course List(s) indicated. Check all boxes that apply:

☐ Written English  ☐ Mathematics  ☐ RIC List

In the space provided, indicate the reason for the course deletion:

☐ Responds to a recommendation in an external undergraduate program review:

☐ The deleted course appears in the course description for other courses in your unit. A Course Modification form is required.

☐ The deleted course appears in program descriptions/charts/elective lists in your unit. A Program Modification Form is required.

A Request for Statement of Support Form is required if:

☐ The deleted course appears in the course description for other courses in another unit.

☐ The deleted course appears in program descriptions/charts/elective lists in another unit.

List courses and/or programs affected (e.g. other courses that use the deleted course as a prerequisite or corequisite; programs that use the course as a required/elective course). Be as specific as possible.

SECTION C – SUPPORTING DOCUMENTATION ATTACHED

☑ Request for Statement of Support Forms and responses received

☐ Program Modification Forms – included with faculty/college/school submission to SCCCC

☑ Course Modification Forms – included with faculty/college/school submission to SCCCC

SECTION D - SIGNATURES*

Department Approval: Richard Sparling 12th of November 2020

Type Name

Date

Faculty/College/School Approval:

Ben Pak Ching Li 1/10/2021

Type Name

Date

*Signatures are not required for Fall 2020 submissions to SCCCC.
STATEMENT OF SUPPORT: PART A – REQUEST FOR ACTION
SCCCC Fall 2020/Spring 2021

Complete Sections A through D of this form. Send a copy, together with Part B and any additional supporting documentation, to unit(s) from which you are seeking a statement of support. The completed form (Sections A through E) is to be submitted to SCCC along with Statements of Support (Part B) received. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes.

SECTION A – UNIT REQUESTING STATEMENT OF SUPPORT
Faculty/College/School: Science
Department or Program: Microbiology (060)

SECTION B – REASON FOR REQUEST FOR SUPPORT
☐ possible curricular overlap or infringement or conflict of jurisdiction with another unit(s)
☒ possible curriculum/course changes in another unit(s) arising from proposed curriculum/course change in your unit
☐ possible impact on demand (increased or decreased) for a specific course(s) in another unit(s)
☐ other (Please elaborate below, in Section C.)

Request for assessment of course intended to satisfy:
☐ Written English ☐ Mathematics ☐ RIC List

Indicate the SCCC deadline your unit will meet: ☐ Fall 2020 ☐ Spring 2021

Indicate date on which request for support – Part A sent to other unit(s):

Request that a response be provided by the date indicated:

SECTION C – DESCRIPTION OF PROPOSED CURRICULUM/COURSE CHANGE
Briefly describe the proposed curriculum/course change in your unit and outline the request for support. Be as specific as possible, including with respect to the potential impact on courses/curricula in the other unit(s).

MBIO 4670 is being deleted. Therefore, it must be described as "the former MBIO 4670" in the course description for MBIO 4672, and this is the modification being proposed. These courses cannot be held together.

SECTION D – UNIT(S) RECEIVING REQUEST FOR STATEMENT OF SUPPORT
List the faculties/colleges/schools/departments solicited for a statement of support.
JMCCB (Joint Microbiology-Chemistry Committee for Biochemistry), Genetics, USB

SECTION E – STATEMENT(S) OF SUPPORT RECEIVED
Attach responses received from other units to your faculty/college/school submission to SCCC.
STATEMENT OF SUPPORT: PART B – RESPONSE & ACTION REQUIRED
SCCC Fall 2020/Spring 2021

Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Microbiology (060)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Science
Department or Program: Science, Faculty of (02)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

MBIO 4670 and MBIO 4672 are listed as microbiology optional courses for the BSc Honours Biochemistry program (inc. Co-op). Since MBIO 4670 has not been offered for several years, there is expected to be very minimal impact to the BSc Honours Biochemistry program (inc. Co-op) if this course is deleted.

The proposed modification to the course description of MBIO 4672 is indicating that the course cannot be held with the "former" MBIO 4670. MBIO 4672 is an optional course BSc Major Biochemistry (inc. Co-op) and BSc Honours Biochemistry (inc. Co-op) students can take and the MBIO 4672 modifications will have very minimal impact to these four programs.

The Joint Microbiology-Chemistry Committee on Biochemistry (JMCCB) believes that the proposed changes will have a minimal impact on the Biochemistry Curriculum.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

BSc Honours Biochemistry program (inc. Co-op)
BSc Major Biochemistry (inc. Co-op)

The deletion of MBIO 4670 will have very minimal impact to the BSc Honours Biochemistry program (inc. Co-op) since the course has not been offered for some time and students have the option of enrolling in MBIO 4672 instead.

The JMCCB believes that the MBIO 4672 course description modifications will have very minimal impact to the BSc Honours Biochemistry program (inc. Co-op) and BSc Major Biochemistry (inc. Co-op) programs.

The JMCCB supports the deletion of MBIO 4670 and proposed modification of MBIO 4672.

The JMCCB will be submitting modifications to SCCC in Spring 2021 in response to the deletion of MBIO 4670.

SECTION J – SIGNATURES

Department Approval: Mazdak Khajehpour Jan 14, 2021

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Faculty/College/School Approval:

Ren Pak Ching Li 1/14/2021

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<th>Type Name</th>
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*Signatures are not required for Spring 2021 submissions to SCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Microbiology (060)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Science
Department or Program: Biological Sciences (071) Science Genetics Program

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

The Genetics program supports the deletion of MBIO 4670 as this course is no longer offered and has been replaced with MBIO 4672 – which is an option for the Genetics Program.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support.
- Indicate when your unit will submit corresponding changes to the SCCC (e.g., Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

The Genetics program is in the process of revising its options list courses and will update the deletion of MBIO 4670 in a submission to SCCC (Fall 2021).

SECTION J – SIGNATURES*

Department Approval:  
Georg Hausner  
Type Name  
Nov. 13th/2020  
Date

Faculty/College/School Approval:  
Ben Pak Ching Li  
Type Name  
1/10/2021  
Date

*Signatures are not required for Fall 2020 submissions to SCCC.
STATEMENT OF SUPPORT: PART B – RESPONSE & ACTION REQUIRED
SCCCC Fall 2020/Spring 2021

Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Microbiology (060)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Université de Saint-Boniface
Department or Program: sciences, Faculte des (USB)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCCC should be aware of.

There is minimal impact for the Université de Saint-Boniface.

The Université de Saint-Boniface supports deleting MBIO 4670 and adding "the former MBIO 4670" in the course description for MBIO 4672.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- **Indicate when your unit will submit corresponding changes to the SCCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCCC deadline indicated on the preceding page, in Section B.**

We will add in the description course MBIO 4581 that "MBIO 4581 will not be held with MBIO 4672 and the former MBIO 4670". Changes will be presented to the next SCCCC.

SECTION J – SIGNATURES

Department Approval:  
**Mathias Oulé**  
Type Name | Signature | Date  
---|---|---  
| | |

Faculty/College/School Approval:

**Alexandre Brassard**  
Type Name | Signature | Date  
---|---|---  
| | |

*Signatures are not required for Spring 2021 submissions to SCCC.
UNDERGRADUATE COURSE MODIFICATION
SCCC Fall 2020/Spring 2021

If the short course title, course number, subject code or number of credit hours is to be changed, do not use this form. The current course MUST be deleted and re-introduced under a new title and/or number and/or different credit hours.
See the Guidelines for Completion of Proposal for Undergraduate/Certificate Course and Curriculum Changes for additional instructions.

SECTION A – COURSE DETAILS

Faculty/College/School: Science
Department or Program: Microbiology (060)

Subject code: MBIO Course number: 2730

Current Long Title: Elements of Biochemistry 1
Revised Long Title (maximum 90 characters):

Current Credit Hours: 3 Revised grading mode: Choose one

Changes Take Effect: Fall 2021
[Indicate Pass/Fail in revised course description]

SECTION B – MODIFIED COURSE DESCRIPTION

Provide the course description, exactly as it would appear in the Academic Calendar. See the Guidelines for information on completing this section of the form, including the examples provided there.

MBIO 2730 Elements of Biochemistry 1 Cr.Hrs. 3
Basic concepts of biochemistry including the properties of biomolecules (amino acids and proteins, enzymes, carbohydrates, lipids, and nucleic acids) and aspects of energy production in cells. Primarily for students in Agricultural and Food Sciences and Four Year Biological Sciences programs in Science. May not be used as part of an Honours, Major, or Minor program in Chemistry. May not be used as part of an Honours or Major program in Microbiology. This course is also given in Chemistry as CHEM 2730. May not be held with the former CHEM 2360, CHEM 2361, CHEM 2700, CHEM 2730, the former CHEM 2770, the former CHEM 2860, the former MBIO 2360, MBIO 2361, MBIO 2700, or the former MBIO 2770. Prerequisites: [one of CHEM 1110, CHEM 1130, the former CHEM 1310, CHEM 1311, or the former CHEM 1320] and [six credit hours of university level BIOL courses or HEAL 1500 and HEAL 1502].

SECTION C – CURRENT COURSE DESCRIPTION

Provide the current course description exactly as it appears in the current Academic Calendar.

MBIO 2730 Elements of Biochemistry 1 Cr.Hrs. 3
Basic concepts of biochemistry including the properties of biomolecules (amino acids and proteins, enzymes, carbohydrates, lipids, and nucleic acids) and aspects of energy production in cells. Primarily for students in Agricultural and Food Sciences and four-year Biological Sciences programs in Science. May not be used as part of an Honours, Major, General, or Minor program in Chemistry or in Microbiology. This course is also given in Chemistry as CHEM 2730. May not be held with the former CHEM 2360, CHEM 2361, CHEM 2700, CHEM 2730, the former CHEM 2770, the former CHEM 2860, the former MBIO 2360, MBIO 2361, MBIO 2700, or the former MBIO 2770. Prerequisites: [one of CHEM 1110, CHEM 1130, the former CHEM 1310, CHEM 1311, or the former CHEM 1320] and six credit hours of university level BIOL courses.
SECTION D – RATIONALE
Provide a brief description of the change(s) and a rationale below.

☐ Responds to a recommendation in an external undergraduate program review.

This change is in response to the proposed changes to the B.Sc. General degree. Given the deletion of the areas of concentration, students can now choose MBIO/CHEM 2730 (and MBIO/CHEM 2750) to provide an introduction to biochemistry. Nonetheless, these courses cannot be used as prerequisites for advanced MBIO courses. The biology preparation provided by HEAL 1500 and HEAL 1502 is sufficient for students to be prepared for CHEM/MBIO 2730.

SECTION E – DETAILS OF PROPOSED MODIFICATION(S)
Adding registration restriction:
Indicate where registration is restricted to students in a faculty/college/school or academic program(s), including level or year of study. List the faculty/college/school and/or programs(s). Indicate registration restrictions in the course description.

Faculty/college/school restrictions:

Program restrictions (e.g. Honours):

Adding / Removing Required Laboratory / Tutorial / Field Trip / Other Activity: Indicate required laboratory / tutorial / field trip / other activity in course description. (Do not use this section to indicate the course being modified already includes one of these requirements.)

The course is being modified in order to:

☐ Add a laboratory
☐ Add a tutorial
☐ Add a field trip
☐ Add other activity
☐ Remove a laboratory
☐ Remove a tutorial
☐ Remove a field trip
☐ Remove other activity

Describe the Other Activity below or use this space to seek SCCC's advice on whether to note an activity in the description.

Written English and Mathematics Requirements, Recommended Introductory Course List for U1: (Do not use this section to indicate the course already satisfies the M/W requirement or is on the RIC List.)

The course, as modified, will:

☐ Satisfy the W requirement and is to be added to the List of Written English Courses.*
☐ Satisfy the M requirement and is to be added to the List of Mathematics Courses.*
☐ Has been accepted for, and is to be added to the RIC List. *
☐ No longer satisfy the W requirement and is to be removed from the List of Written English Courses. *
☐ No longer satisfy the M requirement and is to be removed from the List of Mathematics Courses.*
☐ No longer satisfy and is to be removed from the RIC list. *

*Attach Request for Statement of Support Form(s) and responses received.
Pre- or Corequisites (MUST be taken either before or at the same time)

Adding:

Removing:

Corequisites (MUST be taken at the same time and not be a spanned course)

Adding:

Removing:

Equivalent courses (May NOT be held with existing or former courses with equivalent content, same credit hours, same level. Can be used to meet same program requirements.)

Adding:

Removing:

Mutually exclusive courses (May NOT be held with existing or former courses with significant content overlap and/or different credit hours and/or different level or the same course previously offered as a topics course. Cannot be held together for credit or used to meet the same program requirement.)

Adding: Indicate title of specific topics course sections, if appropriate.

Removing:

SECTION I – SUPPORTING DOCUMENTATION ATTACHED
See the Guidelines for information on required supporting documentation. Attach documents in the following order.

☐ Course outline
☐ Library statement
☐ Request for Statement of Support Form(s) and responses received
☑ Program Modification Form(s) – included with faculty/college/school submission to SCCC

SECTION J – SIGNATURES

Department Approval: Richard Sparling January 12, 2021

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Faculty/College/School Approval:

Ben Pak Ching Li 1/12/2021

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*Signatures are not required for Spring 2021 submissions to SCCC.
SECTION F – RESULTING CHANGES TO COURSES/PROGRAM(S)

See the Guidelines for instructions on how to complete this section of the form. Check all boxes that apply.

This course modification leads to changes to:

- [ ] other courses in your unit Submit Course Modification Forms for those courses.
- [ ] programs in your unit Submit Program Modification Forms.
- [ ] courses in other academic units Requests for Statement of Support Forms are required.
- [ ] program changes in other academic units Requests for Statement of Support Forms are required.
- [x] Other units that use the course will be advised of changes to the course description, including content, prerequisites, corequisites, equivalent and mutually exclusive courses. Requests for Statement of Support Forms are required.

List all courses and/or programs that are affected (e.g. other courses that use the modified course as a prerequisite or corequisite; programs that use the course as a required/elective course), including those in other departments/faculties/colleges/schools. Be as specific as possible.

ANSC 2520, BIOL 3500, BIOL 3501, BIOL 4380, CHEM 2371, CHEM 2710, MBIO 2710, MBIO 2750, HNSC 3300, HNSC 3310, MBIO 2371, MBIO 3430, Animal Science; Animal Systems; B.Sc. Major/Major Co-op and B.Sc. Honours/Honours Co-op in Biological Sciences; Food Science; Human Nutritional Sciences; Interdisciplinary Health Program; Plant Biotechnology; Pre-Vet Medicine; Université de Saint-Boniface; B.Sc. General.

SECTION G – STATEMENT OF ADDITIONAL COSTS, WORKLOAD, AND/OR SUPPLIES

See the Guidelines for instructions on how to complete this section of the form. Indicate where not applicable.

No changes expected.

SECTION H – CHANGES TO PREREQUISITE, COREQUISITE, PRE- OR COREQUISITE, & EQUIVALENCY/MUTUAL EXCLUSIVITY

Include both Aurora and IMS course numbers. Indicate where a minimum letter grade, other than a "C" grade, is required for a prerequisite course, examination, or equivalency test. Indicate where concurrency is allowed. See definitions in the Guidelines.

Prerequisites: (MUST be taken before)

Adding:

Removing:
If the short course title, course number, subject code or number of credit hours is to be changed, do not use this form. The current course MUST be deleted and re-introduced under a new title and/or number and/or different credit hours. See the Guidelines for Completion of Proposal for Undergraduate/Certificate Course and Curriculum Changes for additional instructions.

SECTION A – COURSE DETAILS

Faculty/College/School: Science
Department or Program: Microbiology (060)

Subject code: MBIO Course number: 2750

Current Long Title:
Elements of Biochemistry 2

Revised Long Title (maximum 90 characters):

Current Credit Hours: 3 Revised grading mode: Choose one

Changes Take Effect: Fall 2021

[Indicate Pass/Fail in revised course description]

SECTION B – MODIFIED COURSE DESCRIPTION

Provide the course description, exactly as it would appear in the Academic Calendar. See the Guidelines for information on completing this section of the form, including the examples provided there.

MBIO 2750 Elements of Biochemistry 2 Cr.Hrs. 3

The continuation of CHEM/MBIO 2730, dealing with nitrogen and lipid metabolism, representative biosynthetic pathways, and synthesis and importance of DNA, RNA and proteins. Primarily for students in Agricultural and Food Sciences and four-year Biological Science programs in Science. May not be used as part of an Honours, Major, or Minor program in Chemistry. May not be used as part of an Honours or Major program in Microbiology. This course is also given in Chemistry as CHEM 2750. May not be held with the former CHEM 2370, CHEM 2371, CHEM 2710, CHEM 2750, the former CHEM 2780, the former CHEM 2860, the former MBIO 2370, MBIO 2371, or the former MBIO 2780. Prerequisites: one of CHEM 2730, CHEM 2700, the former CHEM 2770, the former CHEM 2360, CHEM 2361, the former CHEM 2860, MBIO 2730, MBIO 2700, the former MBIO 2770, the former MBIO 2360, or MBIO 2361.

SECTION C – CURRENT COURSE DESCRIPTION

Provide the current course description exactly as it appears in the current Academic Calendar.

MBIO 2750 Elements of Biochemistry 2 Cr.Hrs. 3

The continuation of CHEM/MBIO 2730, dealing with nitrogen and lipid metabolism, representative biosynthetic pathways, and synthesis and importance of DNA, RNA and proteins. Primarily for students in Agricultural and Food Sciences and four-year Biological Science programs in Science. May not be used as part of an Honours, Major, General, or Minor program in Chemistry or Microbiology. This course is also given in Chemistry as CHEM 2750. May not be held with the former CHEM 2370, CHEM 2371, CHEM 2710, CHEM 2750, the former CHEM 2780, the former CHEM 2860, the former MBIO 2370, MBIO 2371, or the former MBIO 2780. Prerequisites: one of CHEM 2730, CHEM 2700, the former CHEM 2770, the former CHEM 2360, CHEM 2361, the former CHEM 2860, MBIO 2730, MBIO 2700, the former MBIO 2770, the former MBIO 2360, or MBIO 2361.
SECTION D – RATIONALE
Provide a brief description of the change(s) and a rationale below.

☐ Responds to a recommendation in an external undergraduate program review.

This change is in response to the proposed changes to the B.Sc. General degree. Given the deletion of the areas of concentration, students can now choose MBIO/CHEM 2750 (and MBIO/CHEM 2730) in order to learn the fundamentals biochemistry. Nonetheless, these courses cannot be used as prerequisites for advanced MBIO courses.

SECTION E – DETAILS OF PROPOSED MODIFICATION(S)
Adding registration restriction:

Indicate where registration is restricted to students in a faculty/college/school or academic program(s), including level or year of study. List the faculty/college/school and/or programs(s). Indicate registration restrictions in the course description.

Faculty/college/school restrictions:

Program restrictions (e.g. Honours):

Adding / Removing Required Laboratory / Tutorial / Field Trip / Other Activity: Indicate required laboratory / tutorial / field trip / other activity in course description. (Do not use this section to indicate the course being modified already includes one of these requirements.)

The course is being modified in order to:

☐ Add a laboratory  ☐ Remove a laboratory
☐ Add a tutorial  ☐ Remove a tutorial  ☐ Remove a field trip
☐ Add a field trip  ☐ Remove other activity
☐ Add other activity

Describe the Other Activity below or use this space to seek SCCCC’s advice on whether to note an activity in the description.

Written English and Mathematics Requirements, Recommended Introductory Course List for U1: (Do not use this section to indicate the course already satisfies the M/W requirement or is on the RIC List.)

The course, as modified, will:

☐ Satisfy the W requirement and is to be added to the List of Written English Courses.*
☐ Satisfy the M requirement and is to be added to the List of Mathematics Courses.*
☐ Has been accepted for, and is to be added to the RIC List.*

☐ No longer satisfy the W requirement and is to be removed from the List of Written English Courses.*
☐ No longer satisfy the M requirement and is to be removed from the List of Mathematics Courses.*
☐ No longer satisfy and is to be removed from the RIC list.*

*Attach Request for Statement of Support Form(s) and responses received.
SECTION F – RESULTING CHANGES TO COURSES/PROGRAM(S)

See the Guidelines for instructions on how to complete this section of the form. Check all boxes that apply.

This course modification leads to changes to:

☐ other courses in your unit Submit Course Modification Forms for those courses.

☐ programs in your unit Submit Program Modification Forms.

☐ courses in other academic units Requests for Statement of Support Forms are required.

☐ program changes in other academic units Requests for Statement of Support Forms are required.

☑ Other units that use the course will be advised of changes to the course description, including content, prerequisites, corequisites, equivalent and mutually exclusive courses. Requests for Statement of Support Forms are required.

List all courses and/or programs that are affected (e.g. other courses that use the modified course as a prerequisite or corequisite; programs that use the course as a required/elective course), including those in other departments/faculties/colleges/schools. Be as specific as possible.

ANSC 2520, BIOL 3500, BIOL 3501, BIOL 4380, CHEM 2371, CHEM 2710, M BIO 2710, MBIO 2750, HNSC 3300, HNSC 3310, MBIO 2371, MBIO 3430, Animal Science; Animal Systems; B.Sc. Major/Major Co-op and B.Sc. Honours/Honours Co-op in Biological Sciences; Food Science; Human Nutritional Sciences; Interdisciplinary Health Program; Plant Biotechnology; Pre-Vet Medicine; Université de Saint-Boniface; B.Sc. General.

***Please see statements of support attached to the undergraduate course modification form for the cross-listed CHEM 2750.

SECTION G – STATEMENT OF ADDITIONAL COSTS, WORKLOAD, AND/OR SUPPLIES

See the Guidelines for instructions on how to complete this section of the form. Indicate where not applicable.

No changes expected.

SECTION H – CHANGES TO PREREQUISITE, COREQUISITE, PRE- OR COREQUISITE, & EQUIVALENCY/MUTUAL EXCLUSIVITY

Include both Aurora and IMS course numbers. Indicate where a minimum letter grade, other than a “C” grade, is required for a prerequisite course, examination, or equivalency test. Indicate where concurrency is allowed. See definitions in the Guidelines.

Prerequisites: (MUST be taken before)

Adding:

Removing:
Pre- or Corequisites (MUST be taken either before or at the same time)

Adding:

Removing:

Corequisites (MUST be taken at the same time and not be a spanned course)

Adding:

Removing:

Equivalent courses (May NOT be held with existing or former courses with equivalent content, same credit hours, same level. Can be used to meet same program requirements.)

Adding:

Removing:

Mutually exclusive courses (May NOT be held with existing or former courses with significant content overlap and/or different credit hours and/or different level or the same course previously offered as a topics course. Cannot be held together for credit or used to meet the same program requirement.)

Adding: Indicate title of specific topics course sections, if appropriate.

Removing:

SECTION I — SUPPORTING DOCUMENTATION ATTACHED

See the Guidelines for information on required supporting documentation. Attach documents in the following order.

- Course outline
- Library statement
- Request for Statement of Support Form(s) and responses received
- Program Modification Form(s) – included with faculty/college/school submission to SCCC

SECTION J – SIGNATURES

Department Approval: Richard Sparling January 12, 2021

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Faculty/College/School Approval:

Ben Pak Ching Li 1/12/2021

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*Signatures are not required for Spring 2021 submissions to SCCC.
STATEMENT OF SUPPORT: PART A – REQUEST FOR ACTION
SCCC Fall 2020/Spring 2021

Complete Sections A through D of this form. Send a copy, together with Part B and any additional supporting documentation, to unit(s) from which you are seeking a statement of support. The completed form (Sections A through E) is to be submitted to SCCC along with Statements of Support (Part B) received. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes.

SECTION A – UNIT REQUESTING STATEMENT OF SUPPORT
Faculty/College/School: Science
Department or Program: Microbiology (060)

SECTION B – REASON FOR REQUEST FOR SUPPORT
☐ possible curricular overlap or infringement or conflict of jurisdiction with another unit(s)
☐ possible curriculum/course changes in another unit(s) arising from proposed curriculum/course change in your unit
☐ possible impact on demand (increased or decreased) for a specific course(s) in another unit(s)
☒ other (Please elaborate below, in Section C.)
Request for assessment of course intended to satisfy:
☐ Written English  ☐ Mathematics  ☐ RIC List

Indicate the SCCC deadline your unit will meet: ☐ Fall 2020  ☐ Spring 2021
Indicate date on which request for support – Part A sent to other unit(s): January 8, 2021
Request that a response be provided by the date indicated: January 15, 2021

SECTION C – DESCRIPTION OF PROPOSED CURRICULUM/COURSE CHANGE

Briefly describe the proposed curriculum/course change in your unit and outline the request for support. Be as specific as possible, including with respect to the potential impact on courses/curricula in the other unit(s).

-Due to proposed changes to the BSc 3-year General Program, CHEM/MBIO 2730, CHEM/MBIO 2750 and CHEM 2740 will be accepted courses in the general degree.
-To bring consistency to the course descriptions of CHEM 2730 with MBIO 2730 and CHEM 2750 with MBIO 2750, CHEM 2730 and CHEM 2750 will be permissible courses for a Minor in Microbiology.
-CHEM/MBIO 2730 currently has a six credit hour BIOL courses prerequisite. We would like to expand the biology prerequisite to deem HEAL 1500 and HEAL 1502 as acceptable prerequisites.
-Since CHEM 2730 and CHEM 2750 are crosslisted as MBIO 2730 and MBIO 2750, respectively, this support form will be used in support of the course modifications of MBIO 2730 and MBIO 2750 as well.

SECTION D – UNIT(S) RECEIVING REQUEST FOR STATEMENT OF SUPPORT
List the faculties/colleges/schools/departments solicited for a statement of support.
Agriculture; Biological Sciences; Interdisciplinary Health; Chemistry; Science; Universite de Saint-Boniface

NOTE: Since courses are joint, Dept of Chemistry is collecting statements of support on behalf of Dept of Microbiology.

SECTION E – STATEMENT(S) OF SUPPORT RECEIVED
Attach responses received from other units to your faculty/college/school submission to SCCC.
STANDARD OF SUPPORT: PART B – RESPONSE & ACTION REQUIRED
SCCCC Fall 2020/Spring 2021

Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Microbiology (060)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Science
Department or Program: Chemistry (002)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

CHEM 2730 and CHEM 2750 are crosslisted with MBIO 2730 and MBIO 2750, respectively. By allowing these four courses to be acceptable advanced science courses in a general degree as well as acceptable courses for a Microbiology minor, we anticipate an increase in enrolment in these courses.

The inclusion of HEAL 1500 and HEAL 1502 as acceptable biology prerequisites will allow students greater flexibility to enroll in CHEM/MBIO 2730.

The Department of Chemistry supports the proposed changes to MBIO 2730 and MBIO 2750.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support.
- Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

CHEM 2730, CHEM 2750

The changes proposed by Microbiology will directly affect CHEM 2730 and CHEM 2750 since these are their crosslisted equivalents. The proposed Microbiology changes are anticipated to encourage additional students to consider a minor in Microbiology as well as interest in taking these courses as part of a General degree.

No further changes will be required from Chemistry to submit to SCCC.

SECTION J – SIGNATURES

Department Approval: Horace Luong

<table>
<thead>
<tr>
<th>Type Name</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horace Luong</td>
<td></td>
<td>January 15, 2021</td>
</tr>
</tbody>
</table>

Faculty/College/School Approval:

Ben Pak Ching Li

<table>
<thead>
<tr>
<th>Type Name</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1/15/2021</td>
</tr>
</tbody>
</table>

*Signatures are not required for Spring 2021 submissions to SCCC.
If the short course title, course number, subject code or number of credit hours is to be changed, do not use this form. The current course MUST be deleted and re-introduced under a new title and/or number and/or different credit hours. See the Guidelines for Completion of Proposal for Undergraduate/Certificate Course and Curriculum Changes for additional instructions.

SECTION A – COURSE DETAILS

Faculty/College/School: Science
Department or Program: Microbiology (060)
Subject code: MBIO Course number: 4672
Current Long Title: Applied Molecular Biology
Revised Long Title (maximum 90 characters):

Current Credit Hours: 3 Revised grading mode: Choose one
[Indicate Pass/Fail in revised course description]

Changes Take Effect: Fall 2021

SECTION B – MODIFIED COURSE DESCRIPTION

Provide the course description, exactly as it would appear in the Academic Calendar. See the Guidelines for information on completing this section of the form, including the examples provided there.

MBIO 4672 Applied Molecular Biology Cr. Hrs. 3
The overall objective of this course is to introduce and describe the current molecular techniques and their application to biological problems. These include, but are not limited to, basic gene cloning, mutagenesis and over-expression. May not be held with the former MBIO 4570, the former MBIO 4670, the former MBIO 4580, MBIO 4581. Prerequisites: [MBIO 3410 or MBIO 3411] and [one of MBIO 2710, the former MBIO 2370, MBIO 2371, CHEM 2710, the former CHEM 2370 or CHEM 2371].

SECTION C – CURRENT COURSE DESCRIPTION

Provide the current course description exactly as it appears in the current Academic Calendar.

MBIO 4672 Applied Molecular Biology Cr. Hrs. 3
The overall objective of this course is to introduce and describe the current molecular techniques and their application to biological problems. These include, but are not limited to, basic gene cloning, mutagenesis and over-expression. May not be held with the former MBIO 4570, MBIO 4670, the former MBIO 4580, MBIO 4581. Prerequisites: [MBIO 3410 or MBIO 3411] and [one of MBIO 2710, the former MBIO 2370, MBIO 2371, CHEM 2710, the former CHEM 2370 or CHEM 2371].

COCAP Secretary Note: Description as approved by 4Cs and Senate in December 2020.
SECTION D – RATIONALE
Provide a brief description of the change(s) and a rationale below.

☐ Responds to a recommendation in an external undergraduate program review.

Jointly with this modification, we are proposing the deletion of MBIO 4670 (Applied Molecular Biology H), a course that has not been offered since 2015. The deletion of this latter course requires us to indicate that the current course MBIO 4672 may not be offered with "the former" MBIO 4670.

SECTION E – DETAILS OF PROPOSED MODIFICATION(S)

Adding registration restriction:

Indicate where registration is restricted to students in a faculty/college/school or academic program(s), including level or year of study. List the faculty/college/school and/or programs(s). Indicate registration restrictions in the course description.

Faculty/college/school restrictions:

Program restrictions (e.g. Honours):

Adding / Removing Required Laboratory / Tutorial / Field Trip / Other Activity: Indicate required laboratory / tutorial / field trip / other activity in course description. (Do not use this section to indicate the course being modified already includes one of these requirements.)

The course is being modified in order to:

☐ Add a laboratory
☐ Add a tutorial
☐ Add a field trip
☐ Add other activity
☐ Remove a laboratory
☐ Remove a tutorial
☐ Remove a field trip
☐ Remove other activity

Describe the Other Activity below or use this space to seek SCCCC’s advice on whether to note an activity in the description.

Written English and Mathematics Requirements, Recommended Introductory Course List for U1: (Do not use this section to indicate the course already satisfies the M/W requirement or is on the RIC List.)

The course, as modified, will:

☐ Satisfy the W requirement and is to be added to the List of Written English Courses.*
☐ Satisfy the M requirement and is to be added to the List of Mathematics Courses.*
☐ Has been accepted for, and is to be added to the RIC List. *

☐ No longer satisfy the W requirement and is to be removed from the List of Written English Courses. *
☐ No longer satisfy the M requirement and is to be removed from the List of Mathematics Courses.*
☐ No longer satisfy and is to be removed from the RIC list. *

*Attach Request for Statement of Support Form(s) and responses received.
SECTION F – RESULTING CHANGES TO COURSES/PROGRAM(S)

See the Guidelines for instructions on how to complete this section of the form. Check all boxes that apply.

This course modification leads to changes to:

☐ other courses in your unit Submit Course Modification Forms for those courses.
☐ programs in your unit Submit Program Modification Forms.
☐ courses in other academic units Requests for Statement of Support Forms are required.
☐ program changes in other academic units Requests for Statement of Support Forms are required.
☐ Other units that use the course will be advised of changes to the course description, including content, prerequisites, corequisites, equivalent and mutually exclusive courses. Requests for Statement of Support Forms are required.

List all courses and/or programs that are affected (e.g. other courses that use the modified course as a prerequisite or corequisite; programs that use the course as a required/elective course), including those in other departments/faculties/colleges/schools. Be as specific as possible.

MBIO 4581; B.Sc. Biochemistry, Genetics and Biotechnology.

SECTION G – STATEMENT OF ADDITIONAL COSTS, WORKLOAD, AND/OR SUPPLIES

See the Guidelines for instructions on how to complete this section of the form. Indicate where not applicable.

n/a

SECTION H – CHANGES TO PREREQUISITE, COREQUISITE, PRE- OR COREQUISITE, & EQUIVALENCY/MUTUAL EXCLUSIVITY

Include both Aurora and IMS course numbers. Indicate where a minimum letter grade, other than a “C” grade, is required for a prerequisite course, examination, or equivalency test. Indicate where concurrency is allowed. See definitions in the Guidelines.

Prerequisites: (MUST be taken before)

Adding:

Removing:
**Pre- or Corequisites** (MUST be taken either before or at the same time)

Adding:

Removing:

**Corequisites** (MUST be taken at the same time and not be a spanned course)

Adding:

Removing:

**Equivalent courses** (May NOT be held with existing or former courses with equivalent content, same credit hours, same level. Can be used to meet same program requirements.)

Adding:

Removing:

**Mutually exclusive courses** (May NOT be held with existing or former courses with significant content overlap and/or different credit hours and/or different level or the same course previously offered as a topics course. Cannot be held together for credit or used to meet the same program requirement.)

Adding: Indicate title of specific topics course sections, if appropriate.

Removing:

---

**SECTION I – SUPPORTING DOCUMENTATION ATTACHED**

See the *Guidelines* for information on required supporting documentation. Attach documents in the following order:

- [ ] Course outline
- [ ] Library statement
- [x] Request for Statement of Support Form(s) and responses received
- [ ] Program Modification Form(s) – included with faculty/college/school submission to SCCCC

---

**SECTION J – SIGNATURES**

Department Approval: Richard Sparling  
Type Name | Signature | Date  
--- | --- | ---  
 | | January 13, 2021

Faculty/College/School Approval:

Ben Pak Ching Li  
Type Name | Signature | Date  
--- | --- | ---  
 | | 1/12/2021

*Signatures are not required for Spring 2021 submissions to SCCCC.*
UNDERGRADUATE PROGRAM MODIFICATION
SCCC Fall 2020/Spring 2021
See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes.

SECTION A
Faculty/College/School: Science
Department or Program: Microbiology (060)
Program (i.e. credential and discipline): B.Sc. General - Micro
Changes Take Effect: Fall 2021

SECTION B – DESCRIPTION OF PROGRAM MODIFICATION
Provide a brief description of the proposed program modification. Limit – 200 words.

The Microbiology program is proposing modifications to the B.Sc. General program, Microbiology concentration, in response to changes proposed by the Faculty of Science. In accordance with the removal of department-specific concentrations from the program, references to the previous B.Sc. General program will be removed from the Microbiology portion of the calendar. In addition, MBio 2730 and MBio 2750 are now allowed to be part of minor program in Microbiology.

SECTION C – RATIONALE
☐ Responds to a recommendation in an external undergraduate program review.

Provide a brief rationale for the program modification in the space provided.

Modifications to the B.Sc. General program are proposed by the Faculty of Science to generate a single program to be used by all students. The new program will increase the breadth in courses taken by students.

SECTION D – ACADEMIC CALENDAR CONTENT
Attach a revised program description, including program charts and any other Academic Calendar content that would require updates to reflect course and curriculum changes. Beginning with the program description as it appears in the current Academic Calendar, clearly indicate proposed changes using strikethrough font (e.g. strikethrough) to indicate content that is to be deleted and bold font to indicate content that is to be added.
SECTION E – STATEMENT OF ADDITIONAL COSTS, WORKLOAD, AND/OR SUPPLIES

See the Guidelines for instructions on how to complete this section of the form. Indicate where not applicable.

While we cannot predict the changes in demand for microbiology courses as a result of these changes, we assume that there will be no significant changes to costs and workloads for the Department of Microbiology.

SECTION F – CONSULTATION WITH OTHER UNITS THAT MIGHT BE AFFECTED BY CHANGES

See the Guidelines for instructions on how to complete this section of the form.

☐ This program modification leads to changes in programs in other units. Requests for Statement of Support Forms are required.

In the space provided, list all programs that are affected, including those in other departments, faculties, colleges, or schools. Be as specific as possible.

SECTION G – SUPPORTING DOCUMENTATION ATTACHED

See the Guidelines for information on required supporting documentation.

☐ Executive summary (required only for significant program modifications)
☐ Transition plan (required for significant program modifications)
☑ Current and revised Academic Calendar content, including program descriptions and charts (required)
☐ SPPC Program Proposal Budget Form
☐ Request for Statement of Support Forms and responses received

SECTION H – SIGNATURES *

Department Approval: Richard Sparling January 12, 2021
Type Name Date

Faculty/College/School Approval:

Ben Pak Ching Li 1/12/2021
Type Name Date

*Signatures are not required for Fall 2020 submissions to SCCC.
4.10 Department of Microbiology

4.10.1 Program Information

Three Year General

As prescribed with all other faculty regulations in See Section 3.2.

Students in this program must select 18 credit hours of 2000, 3000 and (or) 4000-level courses from each of two Science areas. To satisfy the requirement in the area of Microbiology, students must take a minimum of 18 credit hours of Microbiology courses as prescribed in the chart below (subject to the Faculty requirement that of the 36 credit hours in the two advanced level Science areas, at least 6 credit hours must be at the 3000/4000 level).

Students wishing to elect courses in Microbiology in fulfillment of the requirements for the B.Sc. (General) degree should note the following:

- Students must obtain a grade of “C” or better in the following: M Bio 1010, BIOL 1020, BIOL 1030, CHEM 1100, CHEM 1110, and CHEM 1120.
- Microbiology: M Bio 2730 and M Bio 2750 (CHEM 2730 and CHEM 2750) are not available in this program.

4.10.2 Microbiology Program Charts

<table>
<thead>
<tr>
<th>THREE YEAR GENERAL</th>
<th>09 CREDIT HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>M Bio 1010</td>
<td>18 credit hours of 2000, 3000, and (or) 4000 level Microbiology courses (subject to the Faculty requirement that of the 36 credit hours in the two advanced level Science areas, at least 6 credit hours must be at the 3000/4000 level)</td>
</tr>
<tr>
<td>BIOL 1020, BIOL 1030</td>
<td></td>
</tr>
<tr>
<td>CHEM 1100, CHEM 1110</td>
<td></td>
</tr>
<tr>
<td>CHEM 1120</td>
<td></td>
</tr>
</tbody>
</table>
If the short course title, course number, subject code, or number of credit hours is to be changed, the current course MUST be deleted and re-introduced under the new title and/or course number and/or different credit hours.

Place the cursor over each form field for instructions. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes for additional instructions.

SECTION A – COURSE DETAILS

Faculty/College/School:  Science
Department or Program:  Physics and Astronomy (016)
Subject code:  PHYS  
Course number:  1018  
Confirm with Registrar prior to submitting to SCCC.

Long Title (maximum 90 characters):
The Mechanics of Nature

Short Title (maximum 30 characters): The Mechanics of Nature

Credit Hours:  3  
Grading mode:  Letter Grade  
Spanned Course:  
First term offered:  Fall 2021

SECTION B – COURSE DESCRIPTION FOR ACADEMIC CALENDAR

Provide the course description, exactly as it would appear in the Academic Calendar. See the Guidelines for information on completing this section of the form, including the examples provided there.

PHYS 1018 The Mechanics of Nature Cr. Hrs. 3
This course provides an overview of how aspects of the natural world can be modeled using the laws of mechanics within the contexts of everyday life, including astronomy and biology. Students will learn conceptual and calculational tools used to discover the essential physics observed in everyday experiences. Suitable for students seeking an introductory-level general-interest science course, and students seeking to prepare for taking other first year Physics and Astronomy courses. May not be used for credit in a Physics and Astronomy Honours, Joint Honours, or Major program. Not available to students who have previously obtained credit in (grade of C or better), or are concurrently registered in any Physics and Astronomy course, with the exception of ASTR 1830 and the former PHYS 1830. Prerequisite or co-requisite: one of MATH 0401, MATH 1018, Applied Mathematics 40S, Pre-calculus Mathematics 40S, MSKL 0100 offered by Extended Education, or equivalent.

SECTION C – RATIONALE FOR NEW COURSE (See the Guidelines for instructions on how to complete this section of the form.)

Responds to a recommendation in an external undergraduate program review.

Provide a brief rationale for the course introduction in the space provided.

We are introducing PHYS 1018 together with other science essentials courses for several reasons:
1. By offering these courses within the departments, each course can be integrated with the offerings in that department.
2. By offering these as University courses, they provide an opportunity for early remedy of weaker students entering University.
Departments could offer either an in-class aptitude test during the first week of classes or an online aptitude test that students could take any time.
3. Students will be able to take these courses for credit, and possibly have these credits count toward their program. Moreover, students will be able to use the courses to achieve the full-time status required for student aid or subsidies.
SECTION D – REGISTRATION RESTRICTIONS
Indicate where registration is restricted to students in a faculty/college/school or academic program(s), including level or year of study. List the faculty/college/school and/or programs(s). Indicate registration restrictions in the course description.

Faculty/college/school restrictions:

Program restrictions (e.g. Honours):

SECTION E – ADDITIONAL COURSE DETAILS
Laboratory / Tutorial / Field Trip Requirement: Indicate laboratory / tutorial / field trip requirement in course description.

☐ Laboratory required
☐ Field trip required
☐ Tutorial required

Topics Courses:
☐ This is a topics course.
☐ This course can be completed as a topics course multiple times under different titles. Note in course description in Section B of this form.

Written English and Mathematics Requirements, Recommended Introductory Course List for U1: Check all boxes that apply. Attach Request for Statement of Support Form(s) and responses received.

☐ Course satisfies Written English requirement.
☐ Course satisfies Mathematics requirement.
☐ Accepted for Recommended Introductory Course List (RIC List)

SECTION F – RESULTING CHANGES TO COURSES/PROGRAM(S)
See the Guidelines for instructions on how to complete this section of the form. Check all boxes that apply.

This course introduction leads to changes to:

☑ other courses in your unit. Submit a Course Modification proposal for those courses.
☑ programs in your unit. Submit Program Modification Forms.
☑ courses in other academic units. Requests for Statement of Support Forms are required.
☑ program changes in other academic units. Requests for Statement of Support Forms are required.

List all courses and/or programs that are affected, including those in other departments/faculties/colleges/schools. Be as specific as possible.

University of St Boniface; University 1; Extended Education; B.Sc. Joint Honours in Chemistry-Physics; B.Sc. Joint Honours in Mathematics-Physics & Astronomy; B.Sc. Joint Honours in Computer Science-Physics & Astronomy; ENG 1430, ENG 1440, ENG 1450, ENG 1460; MATH 1510; ASTR 1810; PHYS 0900; PHYS 1020; PHYS 1021; PHYS 1050; and PHYS 1051.

The corresponding Physics and Astronomy course modifications will be proposed in Fall 2021 SCCC meeting.
SECTION G – STATEMENT OF ADDITIONAL COSTS, WORKLOAD, AND/OR SUPPLIES
See the Guidelines for instructions on how to complete this section of the form. Indicate where not applicable.
The introduction of this course will add teaching of three credit hours in our Department, the course will be taught by an
instructor or a sessional.

SECTION H – PREREQUISITE, COREQUISITE, PRE- OR COREQUISITE, & EQUIVALENCY/MUTUAL EXCLUSIVITY
List all prerequisite, corequisite, pre- or corequisite, equivalent, and mutually exclusive courses, including all applicable
previous courses numbers (both Aurora and IMS course numbers). See definitions in the Guidelines.
Indicate as a letter grade where a minimum grade for a prerequisite course, examination, or equivalency test is required. A
minimum grade of “C” is assumed. A different minimum grade must be stated. Indicate where concurrency is allowed.
Prerequisites: (MUST be taken before)

Pre- or Corequisites (MUST be taken either before or at the same time)
one of MATH 0401, MATH 1018, Applied Mathematics 40S, Pre-calculus Mathematics 40S, MSKL 0100 offered by Extended
Education, or equivalent.

Corequisites (MUST be taken at the same time and not be a spanned course)

Equivalent courses (May NOT be held with existing or former courses with equivalent content, same credit hours, same level. Can be
used to meet same program requirements.)

Mutually exclusive courses (May NOT be held with existing or former courses with significant content overlap and/or different credit
hours and/or different level or the same course previously offered as a topics course. Cannot be held together for credit or used to meet
the same program requirement.)
any Physics and Astronomy course completed (C or better) or registered for, with the exception of ASTR 1830, PHYS 1830, or
016.183
SECTION I – SUPPORTING DOCUMENTATION ATTACHED

See the Guidelines for information on required supporting documentation.

☑️ Course outline (required)
☑️ Library statement (normally required)
☑️ Request for Statement of Support Forms and responses received
☐ Program Modification Form(s) – included with faculty/college/school submission to SCCCC

SECTION J – SIGNATURES*

Department Approval:  Khodr Shamseddine  
Type Name  
Date  

Faculty/College/School Approval:  
Ben Pak Ching Li  
Type Name  
Date  

*Signatures are not required for Fall 2020 submissions to SCCCC.
PHYS 1018: The Mechanics of Nature

Course Objectives: This course provides an overview of how many aspects of the natural world can be modeled using the laws of mechanics within the contexts of astronomy and biology. Students learn conceptual and calculational tools used to discover the essential physics observed in everyday experiences. The course is suitable for students interested in taking other first year Physics and Astronomy courses but who don’t have the necessary high school prerequisites for that, or for students seeking an introductory-level science elective course.

Course Format: The course material will be delivered in three 50-minute lectures per week or two 75-minute lectures per week. There will be no labs or tutorials associated with this course.

Course Topics:
- Introduction: Units and Dimension Analysis, Vectors
- Kinematics in one dimension
- Kinematics in two dimensions
- Forces and Newton's Laws
- Uniform Circular Motion
- Work and Energy
- Impulse and Momentum
- Rotational Kinematics
- Rotational Dynamics
- Simple Harmonic Motion

Grading and Evaluation: There will be 6-8 assignments throughout the term, which will help the students understand the material better. Moreover, there will be two term tests and a final exam. The weightings of those various assessments will be as follows:

- Term Test 1: 15%
- Term Test 2: 15%
- Final Exam: 45%
- Homework: 25%

Typical low-numerical-boundaries for the letter grades:

- A+  90%
- A  80%
- B+  75%
- B  70%
C+ 65%
C  60%
D  50%
F  <50%

Recommended Textbook and Required Material: TBD by the instructor(s)
## Kindergarten to Senior 3 Physics 30S Topic Chart

The following table provides a quick reference to the different thematic clusters from Kindergarten to Senior 3 Physics. This allows teachers to examine, at a glance, students’ previous exposure to scientific knowledge in different areas. The physics-related content clusters are grey-shaded for reference.

<table>
<thead>
<tr>
<th>Overall Skills and Attitudes</th>
<th>Cluster 0</th>
<th>Cluster 1</th>
<th>Cluster 2</th>
<th>Cluster 3</th>
<th>Cluster 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kindergarten</td>
<td>Trees</td>
<td>Colours</td>
<td>Paper</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Grade 1</td>
<td>Characteristics and Needs of Living Things</td>
<td>The Senses</td>
<td>Characteristics of Objects and Materials</td>
<td>Daily and Seasonal Changes</td>
<td></td>
</tr>
<tr>
<td>Grade 2</td>
<td>Growth and Changes in Plants</td>
<td>Properties of Solids, Liquids, and Gases</td>
<td>Position and Motion</td>
<td>Air and Water in the Environment</td>
<td></td>
</tr>
<tr>
<td>Grade 3</td>
<td>Growth and Changes in Plants</td>
<td>Materials and Structures</td>
<td>Forces that Attract or Repel</td>
<td>Soils in the Environment</td>
<td></td>
</tr>
<tr>
<td>Grade 4</td>
<td>Habitats and Communities</td>
<td>Light</td>
<td>Sound</td>
<td>Rocks, Minerals, and Erosion</td>
<td></td>
</tr>
<tr>
<td>Grade 5</td>
<td>Maintaining a Healthy Body</td>
<td>Properties of and Changes in Substances</td>
<td>Forces and Simple Machines</td>
<td>Weather</td>
<td></td>
</tr>
<tr>
<td>Grade 6</td>
<td>Diversity of Living Things</td>
<td>Flight</td>
<td>Electricity</td>
<td>Exploring the Solar System</td>
<td></td>
</tr>
<tr>
<td>Grade 7</td>
<td>Interactions within Ecosystems</td>
<td>Particle Theory of Matter</td>
<td>Forces and Atitudes</td>
<td>Earth’s Crust</td>
<td></td>
</tr>
<tr>
<td>Grade 8</td>
<td>Cells and Systems</td>
<td>Optics</td>
<td>Fluids</td>
<td>Water Systems</td>
<td></td>
</tr>
<tr>
<td>Senior 1</td>
<td>Reproduction</td>
<td>Atoms and Elements</td>
<td>Nature of Electricity</td>
<td>Exploring the Universe</td>
<td></td>
</tr>
<tr>
<td>Senior 2</td>
<td>Dynamics of Ecosystems</td>
<td>Chemistry in Action</td>
<td>In Motion</td>
<td>Weather Dynamics</td>
<td></td>
</tr>
<tr>
<td>Senior 3</td>
<td>Waves</td>
<td>Nature of Light</td>
<td>Mechanics</td>
<td>Fields</td>
<td></td>
</tr>
</tbody>
</table>

*Figure 6: Kindergarten to Senior 3 Physics 30S Topic Chart*
**TOPIC 1.1: KINEMATICS**

S4P-1-1 Derive the special equations for constant acceleration.

Include: \( \vec{v}_2 = \vec{v}_1 + \vec{a} \Delta t; \Delta \vec{d} = \vec{v}_1 \Delta t + \frac{1}{2} \vec{a} \Delta t^2; \vec{v}_2^2 = \vec{v}_1^2 + 2 \vec{a} \Delta \vec{d} \)

S4P-1-2 Solve problems for objects moving in a straight line with a constant acceleration.

Include: \( \vec{v}_2 = \vec{v}_1 + \vec{a} \Delta t; \Delta \vec{d} = \vec{v}_1 \Delta t + \frac{1}{2} \vec{a} \Delta t^2; \)

\( v_f^2 = v_i^2 + 2ad; \Delta \vec{d} = \left( \frac{v_i + v_f}{2} \right) \Delta t \)

S4P-1-3 Solve relative motion problems for constant velocities using vectors.
TOPIC 1.2: DYNAMICS

S4P-1-4 Solve vector problems for objects in equilibrium.

S4P-1-5 Calculate the forces acting on an object resting on an inclined plane.
Include: normal force, friction, components of the gravitational force (mg)

S4P-1-6 Calculate the components of $F_{\text{grav}}$ exerted on an object resting on an inclined plane.

S4P-1-7 Solve problems with $F_{\text{friction}}$ for objects on a horizontal surface and on an inclined plane.
Include: coefficient of friction

S4P-1-8 Solve problems using $\vec{F}_{\text{net}} = m \vec{a}$ where $\vec{F}_{\text{net}} = \vec{F}_{\text{applied}} + \vec{F}_{\text{friction}}$ and using kinematics equations from above.
Include: $\vec{F}_{\text{applied}}$ at an angle to horizontal motion; combined mass systems; $\vec{F}_{\text{applied}}$ on an inclined plane; forces acting at various angles on a body

S4P-1-9 Perform an experiment to investigate forces acting on an object.
**TOPIC 1.3: MOMENTUM**

S4P-1-10 Derive the impulse-momentum equation from Newton's second law.

S4P-1-11 Determine impulse from the area under a force-time graph.
Include: constant positive and negative force, uniformly changing force

S4P-1-12 Experiment to illustrate the Law of Conservation of Momentum in one and two dimensions.

S4P-1-13 Solve problems using the impulse-momentum equation and Law of Conservation of Momentum.

S4P-1-14 Relate the impulse-momentum equation to real-life situations.
*Examples: hitting a ball, catching a ball*
TOPIC 1.4: PROJECTILE MOTION

S4P-1-15  Solve simple free-fall problems using the special equations for constant acceleration.
           Include: horizontal and vertical components of motion of the curved path of a projectile (without air resistance)

S4P-1-16  Draw free-body diagrams for a projectile at various points along its path (with and without air resistance).

S4P-1-17  Calculate the horizontal and vertical components with respect to velocity and position of a projectile at various points along its path.

S4P-1-18  Solve problems for projectiles launched horizontally and at various angles to the horizontal to calculate maximum height, range, and overall time of flight of the projectile.
**TOPIC 1.5: CIRCULAR MOTION**

S4P-1-19 Explain qualitatively why an object moving at constant speed in a circle is accelerating toward the centre of the circle.

S4P-1-20 Discuss the centrifugal effects with respect to Newton’s laws.

S4P-1-21 Draw free-body diagrams of an object moving in uniform circular motion.

S4P-1-22 Experiment to determine the mathematical relationship between period and frequency and one or more of the following: centripetal force, mass, and radius.

S4P-1-23 Derive an equation for the constant speed and acceleration of an object moving in a circle

\[
\begin{align*}
\vec{v} &= \frac{2\pi r}{T}, \\
a &= \frac{v^2}{R}
\end{align*}
\]

S4P-1-24 Solve problems for an object moving with a constant speed in a circle using

\[
a = \frac{v^2}{R}, \quad \vec{v} = \frac{2\pi r}{T}, \quad \text{and} \quad \vec{F}_{net} = m\vec{a}.
\]
TOPIC 1.6: WORK AND ENERGY

S4P-1-25 Define work as the product of displacement and the component of force parallel to the displacement when the force is constant.

S4P-1-26 Determine work from the area under the force-position graph for any force.
Include: positive or negative force, uniformly changing force

S4P-1-27 Describe work as a transfer of energy.
Include: positive and negative work, kinetic work, conservation of energy

S4P-1-28 Give examples of various forms of energy and describe qualitatively the means by which they can perform work.

S4P-1-29 Derive the equation for kinetic energy using $W = \vec{F} \cdot \Delta \vec{d} \cos \theta$ and kinematics equations.

S4P-1-30 Derive the equation for gravitational potential energy near the surface of the Earth ($E_p = mgh$).

S4P-1-31 Experiment to determine Hooke’s Law $\left( \vec{F} = -k \vec{x} \right)$

S4P-1-32 Derive an equation for the potential energy of a spring, using Hooke’s Law and a force-displacement graph.

S4P-1-33 Solve problems related to the conservation of energy.
Include: gravitational and spring potential, and kinetic energy


**TOPIC 2.1: EXPLORATION OF SPACE**

S4P-2-1 Identify and analyze issues pertaining to space exploration.

*Examples: scale of the universe, technological advancement, promotion of global co-operation, social and economic benefits, allocation of resources shifted away from other pursuits, possibility of disaster*

S4P-2-2 Describe planetary motion using Kepler’s three laws.

*Examples: relate Kepler’s Third Law to objects other than planets, such as comets, satellites, and spacecraft*

S4P-2-3 Outline Newton’s Law of Universal Gravitation and solve problems using

\[ F_g = \frac{Gm_1m_2}{r^2}, \]

S4P-2-4 State the gravitational potential energy as the area under the force-separation curve and solve problems using

\[ E_g = \frac{-Gm_1m_2}{r} \]

S4P-2-5 Solve problems for the escape velocity of a spacecraft.

*Include: Law of Conservation of Energy, binding energy*
**TOPIC 2.2: LOW EARTH ORBIT**

S4P-2-6 Compare the Law of Universal Gravitation with the weight (mg) of an object at various distances from the surface of the Earth and describe the gravitational field as \( g = \frac{Gm_{\text{Earth}}}{r^2} \).

S4P-2-7 Outline Newton's thought experiment regarding how an artificial satellite can be made to orbit the earth.

S4P-2-8 Use the Law of Universal Gravitation and circular motion to calculate the characteristics of the motion of a satellite.
Include: orbital period, speed, altitude above a planetary surface, mass of the central body, and the location of geosynchronous satellites.

S4P-2-9 Define microgravity as an environment in which the apparent weight of a system is smaller than its actual weight.

S4P-2-10 Describe conditions under which microgravity can be produced.
*Examples: jumping off a diving board, roller-coaster, free fall, parabolic flight, orbiting spacecraft*

S4P-2-11 Outline the factors involved in the re-entry of an object into Earth's atmosphere.
Include: friction and g-forces.

S4P-2-12 Describe qualitatively some of the technological challenges to exploring deep space.
*Examples: communication, flyby and the "slingshot" effect, Hohmann Transfer orbits (least-energy orbits)*
**TOPIC 2.3: ELECTRIC AND MAGNETIC FIELDS**

S4P-2-13  Compare and contrast the inverse square nature of gravitational and electric fields.

S4P-2-14  State Coulomb's Law and solve problems for more than one electric force acting on a charge.
Include: one and two dimensions

S4P-2-15  Illustrate, using diagrams, how the charge distribution on two oppositely charged parallel plates results in a uniform field.

S4P-2-16  Derive an equation for the electric potential energy between two oppositely charged parallel plates \((E_p = qE \Delta d)\).

S4P-2-17  Describe electric potential as the electric potential energy per unit charge.

S4P-2-18  Identify the unit of electric potential as the volt.

S4P-2-19  Define electric potential difference (voltage) and express the electric field between two oppositely charged parallel plates in terms of voltage and the separation between the plates \(E = \frac{\Delta V}{d}\).

S4P-2-20  Solve problems for charges moving between or through parallel plates.

S4P-2-21  Use hand rules to describe the directional relationships between electric and magnetic fields and moving charges.

S4P-2-22  Describe qualitatively various technologies that use electric and magnetic fields.
*Examples: electromagnetic devices (such as a solenoid, motor, bell, or relay), cathode ray tube, mass spectrometer, antenna*
**TOPIC 3.1: ELECTRIC CIRCUITS**

S4P-3-1  Describe the origin of conventional current and relate its direction to the electron flow in a conductor.

S4P-3-2  Describe the historical development of Ohm’s Law.
          Include: contributions of Gray, Ohm, Joule, and Kirchoff

S4P-3-3  Investigate the relationships among resistance and resistivity, length, cross-section, and temperature.
          Include: \( R = \frac{\rho L}{A} \)

S4P-3-4  Demonstrate the ability to construct circuits from schematic diagrams for series, parallel, and combined networks.
          Include: correct placement of ammeters and voltmeters

S4P-3-5  Calculate the total resistance for resistors in series and resistors in parallel.

S4P-3-6  Calculate the resistance, current, voltage, and power for series, parallel, and combined networks.
          Include: \( P = IV \), \( P = I^2R \), and \( P = \frac{V^2}{R} \).
**TOPIC 3.2: ELECTROMAGNETIC INDUCTION**

S4P-3-7 Define magnetic flux \( \Phi = B \cdot A \).

S4P-3-8 Demonstrate how a change in magnetic flux induces voltage.

S4P-3-9 Calculate the magnitude of the induced voltage in coils using \( V = \frac{N \Delta \Phi}{\Delta t} \).

S4P-3-10 Outline Lenz’s Law and apply to related problems.

S4P-3-11 Describe the operation of an AC generator.

S4P-3-12 Graph voltage versus angle for the AC cycle.

S4P-3-13 Describe the operation of transformers.

S4P-3-14 Solve problems using the transformer ratio of \( \frac{V_2}{V_1} = \frac{N_2}{N_1} \).

S4P-3-15 Describe the generation, transmission, and distribution of electricity in Manitoba.

Include: step-up and step-down transformers, power transfer, High Voltage Direct Current
**TOPIC 4.1: MEDICAL PHYSICS**

S4P-4-1 Describe the nuclear model of the atom.
Include: proton, neutron, nucleus, nuclear forces, stability, isotope, mass number, electron, ion

S4P-4-2 Define radioactivity as a nuclear change that releases energy.
Include: Becquerel units, radioactive decay, half life

S4P-4-3 Perform decay calculations using integer numbers of half life.

S4P-4-4 Describe the following types of radiation: alpha, beta, and electromagnetic radiation.
Include: particle radiation, wave radiation, electromagnetic spectrum, linear energy transfer

S4P-4-5 Compare and contrast sources and characteristics of ionizing radiation and non-ionizing radiation.
Include: NORM (Naturally Occurring Radioactive Materials), radon, background radiation, incandescent light bulb, hot objects

S4P-4-6 Describe various applications of non-ionizing radiation.
*Examples: communications, microwave oven, laser, tanning bed*

S4P-4-7 Describe various applications of ionizing radiation.
*Examples: food irradiation, sterilization, smoke alarm*

S4P-4-8 Describe the effects of non-ionizing and ionizing radiation on the human body.
Include: equivalency of sievert (Sv) and rem units, solar erythema (sunburn)

S4P-4-9 Research, identify, and examine the application of radiation to diagnostic imaging and treatment techniques.
*Examples: nuclear medicine imagery techniques such as MRI, ultrasound, endoscopy, X-ray, CT scanning, PET, heavy isotopes such as Ba; nuclear medicine therapies such as brachitherapy, external beam, gamma knife*
University of Manitoba Libraries
Statement for Undergraduate Curriculum Change

Faculty: Science
Department: Physics and Astronomy
Course #: PHYS 1018
Course Name: The Mechanics of Nature

The Libraries' collection can support this new course, as it was described in the documents provided.

It is not expected that this proposed change will affect the Libraries' ability to continue to provide services such as research and teaching support, reference assistance, document delivery, and the technical infrastructure which allows the discovery and delivery of the Libraries' resources and services.

Vickie Albrecht
Acting Head, Sciences Division

Kristen Kruse
Coordinator, Collections Management

Lisa Hanson O'Hara
Vice Provost (Libraries) & University Librarian

November 16, 2020
Date
STATEMENT OF SUPPORT: PART A – REQUEST FOR ACTION
SCCC Fall 2020/Spring 2021
Complete Sections A through D of this form. Send a copy, together with Part B and any additional supporting documentation, to unit(s) from which you are seeking a statement of support. The completed form (Sections A through E) is to be submitted to SCCCC along with Statements of Support (Part B) received. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes.

SECTION A – UNIT REQUESTING STATEMENT OF SUPPORT
Faculty/College/School: Science
Department or Program: Physics and Astronomy (036)

SECTION B – REASON FOR REQUEST FOR SUPPORT
☐ possible curricular overlap or infringement or conflict of jurisdiction with another unit(s)
☑ possible curriculum/course changes in another unit(s) arising from proposed curriculum/course change in your unit
☐ possible impact on demand (increased or decreased) for a specific course(s) in another unit(s)
☐ other (Please elaborate below, in Section C.)
Request for assessment of course intended to satisfy:
☐ Written English  ☐ Mathematics  ☑ RIC List
Indicate the SCCCC deadline your unit will meet: ☐ Fall 2020  ☑ Spring 2021
Indicate date on which request for support – Part A sent to other unit(s): November 12, 2020
Request that a response be provided by the date indicated: November 20, 2020

SECTION C – DESCRIPTION OF PROPOSED CURRICULUM/COURSE CHANGE
Briefly describe the proposed curriculum/course change in your unit and outline the request for support. Be as specific as possible, including with respect to the potential impact on courses/curricula in the other unit(s).
We are introducing this 3 credit-hour course to replace PHYS 0900 and PSKL 0100 (offered by Extended Education) as a prerequisite for PHYS 1020 and PHYS 1050. By offering this course as a University course for credit, 1) we will provide an early remedy for weaker students entering the University; 2) we will be able to integrate the essentials course better with our first year offerings; and 3) the students will be able to take this course for credit and possibly have those credits count towards their program. Moreover, the students will be able to use this course to achieve the full-time status required by student aid and subsidies (which was not possible with neither PHYS 0900 nor PSKL 0100). This course introduction will trigger a course change for any current courses listing PHYS 0900 or PSKL 0100 as a prerequisite, namely: ENG 1430, ENG 1440, ENG 1450, ENG 1460; MATH 1510; ASTR 1810, PHYS 1020, PHYS 1021, PHYS 1050, PHYS 1051

SECTION D – UNIT(S) RECEIVING REQUEST FOR STATEMENT OF SUPPORT
List the faculties/colleges/schools/departments solicited for a statement of support.
Faculty of Engineering; University of St Boniface; University 1; Extended Education; Department of Mathematics; Department of Chemistry, Department of Computer Science

SECTION E – STATEMENT(S) OF SUPPORT RECEIVED
Attach responses received from other units to your faculty/college/school submission to SCCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Physics and Astronomy (016)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Engineering
Department or Program: Engineering, Preliminary Year (130)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

The change will have no impact on our courses. Courses in the preliminary engineering program that listed Physics 40s, PHYS 0900 as pre-requisite will also list PHYS 1018.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- Indicate when your unit will submit corresponding changes to the SCCC (e.g., Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

ENG 1430, ENG 1440, ENG 1450, ENG 1460 will list PHYS 1018 as equivalent to Physics 40s. Changes will be submitted to SCCC in Spring 2021.

SECTION J – SIGNATURES*

Department Approval:  
NA

Type Name

Date

Faculty/College/School Approval:

Ahmed Shalaby

Nov 17, 2020

Type Name

Date

*Signatures are not required for Fall 2020 submissions to SCCC.
STATEMENT OF SUPPORT: PART B – RESPONSE & ACTION REQUIRED
SCCCC Fall 2020/Spring 2021

Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Physics and Astronomy (016)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Université de Saint-Boniface
Department or Program: sciences, Faculte des (USB)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

The Department of Mathematical Sciences at the Université de Saint-Boniface supports the introduction of PHYS 1018, but would appreciate if the USB course MATH 0401, which is equivalent to MSKL 0100, would be added to the list of prerequisite or co-requisite.

We do not expect any significant impact at USB.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
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- Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

The prerequisite for PHYS 1021 and PHYS 1051 will need to be modified to take into consideration the new course PHYS 1018. Those changes will be submitted to the SCCC no later than Spring 2022.

SECTION J – SIGNATURES*

Department Approval:  Nicolas Bouffard  16 novembre 2020

Type Name  Date

Faculty/College/School Approval:

Alexandre Brassard  21 novembre 2020

Type Name  Date

*Signatures are not required for Fall 2020 submissions to SCCC.
STATEMENT OF SUPPORT: PART B – RESPONSE & ACTION REQUIRED
SCCC Fall 2020/Spring 2021

Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Physics and Astronomy (016)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: University 1
Department or Program: Choose one

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCCC should be aware of.

we are in support of these changes

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support.
- Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

SECTION J – SIGNATURES*

Department Approval:

<table>
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Faculty/College/School Approval:

<table>
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<tr>
<th>Brandy Usick</th>
<th>January 11, 2021</th>
</tr>
</thead>
</table>

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*Signatures are not required for Fall 2020 submissions to SCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Physics and Astronomy (016)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Choose one
Department or Program: Choose one

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.
No concerns
Extended Education has been in conversation with the Faculty of Science regarding the creation of degree credit preparatory science courses
We are in support of this change

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

PHYSICS SKILLS (PSKL) 100 - non-degree credit preparatory course
the suite of preparatory courses offered by Extended Education are not part of a program thus the potential cancelling of these non-degree credit courses will not have extended impacts to our programming.

SECTION J – SIGNATURES*

Department Approval: N/A

Type Name

Date

Faculty/College/School Approval:

ROD LASTRA (ASSOCIATE)

NOV 17 2020

Type Name

Date

*Signatures are not required for Fall 2020 submissions to SCCC.
SECTION F – UNIT REQUESTING SUPPORT

Faculty/College/School: Science
Department or Program: Physics and Astronomy (016)

SECTION G – UNIT RESPONDING TO REQUEST

Faculty/College/School: Science
Department or Program: Mathematics (136)

SECTION H – RESPONSE TO REQUEST

Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

The Dept of Mathematics supports this request and will plan to proceed with changes to MATH 1513 in SCCC Fall 2021 meeting to include PHYS 1018 as suitable substitute for Physics 40S.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support.
- Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.

MATH 1510: include PHYS 1018 as suitable substitute for Physics 405, to be proposed in Fall 2021.

SECTION J – SIGNATURES*

Department Approval: Derek Krepski 13 Nov 2020
Type Name Date

Faculty/College/School Approval:

Ben Pak Ching Li 1/12/2021
Type Name Date

*Signatures are not required for Fall 2020 submissions to SCCC.
STATEMENT OF SUPPORT: PART B – RESPONSE & ACTION REQUIRED
SCCC Fall 2020/Spring 2021

Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the *Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes*. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School:  Science
Department or Program:  Physics and Astronomy (016)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School:  Science
Department or Program:  Chemistry (002)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

The introduction of PHYS 1018 to replace PHYS 0900 or PSKL 0100 as a prerequisite for PHYS 1020 and PHYS 1050 will provide students with a great opportunity to receive credit and also help support weaker students prior to them taking PHYS 1020 and PHYS 1050.

The introduction of PHYS 1018 will not impact the courses offered by the Department of Chemistry.

The Department of Chemistry supports the introduction of the course.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- **Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.**

B.Sc. Joint Honours in Chemistry-Physics

Students in the B.Sc. Joint Honours in Chemistry-Physics program will not be able to use PHYS 1018 for credit.

No courses offered by the Department of Chemistry are impacted as a result of introducing and offering PHYS 1018.

The corresponding Chemistry program modifications will be proposed in fall 2021 SCCC meeting.

SECTION J – SIGNATURES*

Department Approval:  Horace Luong  
Type Name  
November 14, 2020  
Date

Faculty/College/School Approval:

Ben Pak Ching Li  
Type Name  
1/12/2021  
Date

*Signatures are not required for Fall 2020 submissions to SCCC.
Section F is to be completed by the unit requesting a statement of support. Sections G through J are to be completed by the unit responding to the request. See the Guidelines for Completion of Undergraduate/Certificate Course and Curriculum Changes. The completed form (Part B) is to be returned to the unit requesting support.

SECTION F – UNIT REQUESTING SUPPORT
Faculty/College/School: Science
Department or Program: Physics and Astronomy (016)

SECTION G – UNIT RESPONDING TO REQUEST
Faculty/College/School: Science
Department or Program: Computer Science (074)

SECTION H – RESPONSE TO REQUEST
Identify any impacts on course/curricula in your unit. Indicate whether and why your unit supports the curriculum/course change or outline any specific concerns the proposing unit and SCCC should be aware of.

Computer Science supports this course change (i.e., introduction of PHYS 1018 to replace PHYS 0900 and PSKL 0100) as this proposed course change may have no/minimal impact to COMP.

See next page.
SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND ACTION REQUIRED

- List courses/programs in your unit that would be impacted by the proposed course/curriculum changes.
- Describe the impact on your courses/programs and respond, in particular, to the reason for the request for support indicated on the preceding page, in Section B – Reason for Request for Support
- **Indicate when your unit will submit corresponding changes to the SCCC (e.g. Fall 2020 or Spring 2021). In most cases, this will be the SCCC deadline indicated on the preceding page, in Section B.**

As the proposed changes may have no/minimal impact to COMP and its BSc(Hons) in COMP-PHYS, no corresponding changes are planned to submit to the SCCC.

SECTION J – SIGNATURES*

Department Approval:  

<table>
<thead>
<tr>
<th>Carson Leung</th>
<th>Nov 12 2020</th>
</tr>
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Faculty/College/School Approval:

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<tbody>
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</tbody>
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*Signatures are not required for Fall 2020 submissions to SCCC.
SECTION A
Faculty/College/School: Science
Department or Program: Physics and Astronomy (016)
Program (i.e. credential and discipline): B.Sc. General Degree - Physics and Astronomy option
Changes Take Effect: Fall 2021

SECTION B – DESCRIPTION OF PROGRAM MODIFICATION
Provide a brief description of the proposed program modification. Limit – 200 words.
The Physics and Astronomy department is proposing to remove the three-year B.Sc. General program's chart from the Physics and Astronomy's section in the undergraduate calendar, in response to proposed changes by the Faculty of Science.

SECTION C – RATIONALE
☑ Responds to a recommendation in an external undergraduate program review.
Provide a brief rationale for the program modification in the space provided.
The proposed change is in response to the proposed changes to the three-year B.Sc. general degree program by the Faculty of Science which include removing the requirement that students must choose 2 areas in the advanced courses, or complete either a biological sciences or chemistry focus.

SECTION D – ACADEMIC CALENDAR CONTENT
Attach a revised program description, including program charts and any other Academic Calendar content that would require updates to reflect course and curriculum changes. Beginning with the program description as it appears in the current Academic Calendar, clearly indicate proposed changes using strikethrough font (e.g. strike-through) to indicate content that is to be deleted and bold font to indicate content that is to be added.
SECTION E – STATEMENT OF ADDITIONAL COSTS, WORKLOAD, AND/OR SUPPLIES

See the Guidelines for instructions on how to complete this section of the form. Indicate where not applicable.

No additional costs, or workload will be expected as result of the proposed change.

SECTION F – CONSULTATION WITH OTHER UNITS THAT MIGHT BE AFFECTED BY CHANGES

See the Guidelines for instructions on how to complete this section of the form.

☐ This program modification leads to changes in programs in other units. Requests for Statement of Support Forms are required.

In the space provided, list all programs that are affected, including those in other departments, faculties, colleges, or schools. Be as specific as possible.

None

SECTION G – SUPPORTING DOCUMENTATION ATTACHED

See the Guidelines for information on required supporting documentation. Attach documents in the following order.

☐ Executive summary (required only for significant program modifications)
☐ Transition plan (required for significant program modifications)
☑ Current and revised Academic Calendar content, including program descriptions and charts (required)
☐ SPPC Program Proposal Budget Form
☐ Request for Statement of Support Forms and responses received

SECTION H – SIGNATURES

Department Approval: Khadr Shamseddine

Type Name: Signature *

Digitally signed by Khadr Shamseddine
Date: 2020-12-30 14:02:22 -0800

December 30, 2020

Faculty/College/School Approval:

Ben Pak Ching Li

Type Name: Signature *

Date: 1/10/2021

*Signatures are not required for Spring 2021 submissions to SCCCC.
4.11.1 Program Information

Three-Year-General

As prescribed with all other faculty regulations in Section 3.2, students in this program must select 36 credit hours of 2000 and (or) 3000 level courses from two Science departments. To satisfy the requirement in the Department of Physics and Astronomy, students must select a minimum of 18 credit hours from the list in the chart below.

4.11.2 Physics and Astronomy Program Charts

<table>
<thead>
<tr>
<th>THREE-YEAR-GENERAL 90 CREDIT HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 1050 (C) (or PHYS 1020 (C+)) and PHYS 1070 (C) (or PHYS 1030 (C+))</td>
</tr>
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</table>
SECTION A
Faculty/College/School: Science
Department or Program: Statistics (005)
Program (i.e. credential and discipline): B.Sc. three-year General Degree - Statistics Concentration
Changes Take Effect: Fall 2021

SECTION B – DESCRIPTION OF PROGRAM MODIFICATION
Provide a brief description of the proposed program modification. Limit – 200 words.

The Department of Statistics is proposing to delete its Statistics Concentration from the three-year General Degree. The Faculty of Science is suggesting major changes to its three-year General Degree, which includes the deletion of all areas of concentration. The Department of Statistics supports all the suggested changes and, as a consequence, is making this proposal.

SECTION C – RATIONALE
☑ Responds to a recommendation in an external undergraduate program review.
Provide a brief rationale for the program modification in the space provided.
See above.

SECTION D – ACADEMIC CALENDAR CONTENT
Attach a revised program description, including program charts and any other Academic Calendar content that would require updates to reflect course and curriculum changes. Beginning with the program description as it appears in the current Academic Calendar, clearly indicate proposed changes using strikethrough font (e.g. strikethrough) to indicate content that is to be deleted and bold font to indicate content that is to be added.
SECTION E – STATEMENT OF ADDITIONAL COSTS, WORKLOAD, AND/OR SUPPLIES
See the Guidelines for instructions on how to complete this section of the form. Indicate where not applicable.

The suggested changes will have no incurred costs and significant impact on the workload of the Department of Statistics.

SECTION F – CONSULTATION WITH OTHER UNITS THAT MIGHT BE AFFECTED BY CHANGES
See the Guidelines for instructions on how to complete this section of the form.

☐ This program modification leads to changes in programs in other units. Requests for Statement of Support Forms are required.

In the space provided, list all programs that are affected, including those in other departments, faculties, colleges, or schools. Be as specific as possible.

SECTION G – SUPPORTING DOCUMENTATION ATTACHED
See the Guidelines for information on required supporting documentation. Attach documents in the following order.

☐ Executive summary (required only for significant program modifications)
☐ Transition plan (required for significant program modifications)
☑ Current and revised Academic Calendar content, including program descriptions and charts (required)
☐ SPPC Program Proposal Budget Form
☐ Request for Statement of Support: Forms and responses received

SECTION H – SIGNATURES

Department Approval: Alexandre Leblanc

<table>
<thead>
<tr>
<th>Type Name</th>
<th>Signature *</th>
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Faculty/College/School Approval:

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<tr>
<td>Ben Pak Ching Li</td>
<td></td>
<td>1/10/2021</td>
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*Signatures are not required for Spring 2021 submissions to SCCC.
4.13.1 Program Information

Three-Year General

As prescribed with all other faculty regulations in Section 3.2, students in this program must select 18 credit hours of 2000, 3000, or 4000 level courses from each of two science areas. To satisfy the requirement in the area of Statistics, students must take a minimum of 18 credit hours of 2000, 3000 and (or) 4000 level Statistics courses. STAT-2000 and STAT-2150 cannot be used towards this requirement.

4.13.2 Statistics Program Charts
As approved by 4Cs and Senate in Fall 2020

<table>
<thead>
<tr>
<th>4.13.2 Statistics</th>
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<tr>
<td>YEAR 1</td>
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<tr>
<td>THREE YEAR GENERAL 90 CREDIT HOURS</td>
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<td>STAT-1150², STAT 2150</td>
<td>STAT-2000</td>
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<tr>
<td>15 additional credit hours of 2000, 3000, and (or) 4000 level Statistics courses⁴</td>
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