Final Assessment Report

BSc Sciences
Undergraduate Program
(reviewed 2019-20)

A. Summary

1. The Department's Self Study was considered and approved by the Senate Academic Review Committee on November 12, 2019.
2. The Review Committee consisted of two external reviewers: Shantanu Basu (University of Western Ontario) and Tricia Carmichael (Windsor University) and one internal reviewer, Bareket Falk (Brock University).
3. The review occurred on June 16-17, 2020 via video-conference.
4. The Reviewers' Report was received on July 14, 2020.
5. The Senate Undergraduate Program Committee response was received on July 22, 2020.
6. The program response from the Associate Dean was received on August 4, 2020.
7. The Dean of Mathematics and Science response was received on August 13, 2020.

This review was conducted under the terms and conditions of the IQAP approved by Senate on May 25, 2016.

Program Outcome Categories:

Based on their knowledge of the discipline, the content of the Self-Study and the interviews conducted during the site visit, the Review Committee gave the programs the following Outcome Categories:

Program(s)	Excellent Quality	Good Quality	Good Quality with Concerns	Non-Viable
BSc Sciences (Honours)		X		
BSc Sciences (Pass)		X		

Executive Summary:

The Reviewers wrote:

> The BSc Sciences program is an important program at Brock that fills the needs of diverse groups of students and is essential for the progression of some students to graduation. The course Transitioning to University Science FMSC1POO is a vital component of the program; with the recommended development, it has the potential to increase enrolment in the program. Academic advising is especially important due to the flexible nature of the program. It is recommended to strengthen the advising component by developing some suggested pathways through the program that lead to differing career outcomes. To better advise students and develop these pathways, it will be important to develop a robust method to track outcomes for BSc Sciences students.

B. Strengths of the Program

The reviewers noted the following strengths:

The BSc Sciences program is a necessary and critical program for groups of students with diverse needs: students targeting professional schools and don't want a specialized degree, students coming in from high school with weak marks or missing requirements, students adjudicated out of their university programs, and students who are undecided about their career path. The BSc Sciences program is thus essential to Brock as a multipurpose program. The program is comfortable with its purpose and goals. It acts as a convenient option that is essential for the progression of some students to graduation.

A particular strength of the program is the Transitioning to University Science course FMSC1POO, introduced in Fall 2019 to prepare students for a university education. This course, with appropriate development, has the potential to be a feature that can draw students into the program.

Students have the ability to declare two minors in this program, which gives them priority to register in desired courses. This feature remedies previous problems in which course occupancy limits and preference to program majors and minors prevented students in BSc Sciences from registering, particularly in upper level courses.

Academic advising is critical to this program to help students design their degree pathways. It is currently handled well on a one-on-one basis and is accessible to students. Considering the high importance of academic advising in this highly flexible degree program, the support should be augmented even further (see Recommendation #2).

C. Opportunities for Improvement and Enhancement

Recommendation #1

Empower a faculty member to be a champion for FMS 1POO and revamp the course to balance the content to include topics in numeracy, writing, information literacy, professional skills, presentation skills, and EDI [Equity, Diversity, Inclusion] issues in STEM.

The program response from the Associate Dean stated:

> The course FMSC 1P00: Transitioning to University Science was launched last year and will definitely evolve as we learn more and more what works and what does not. The goal of this course, as its title suggests, is to get students ready for their science education at the university level, and this should remain so whatever revamping is done to the contents.
>
> … Most of the topics indicated by the reviewers are already included in the contents. Foundational math is an important part of the content and we do not want to sacrifice that at the expense of many others. Even if MATH 1P20 may be said to address the foundational math issue, there is ample evidence that the same skills in math need to be repeated for anybody to gain true proficiency in this area.
>
> … We disagree that FMSC 1P00 is the right place to discuss these [Equity, Diversity, and Inclusion as well as Decolonization in Science] topics, for the following reasons:
>
> 1. The course was never designed to address such issues, and does not form the most important part of 'Transitioning to University Science'.
> 2. There is no real expertise within the Faculty of Math and Science instructors to discuss these issues with the intellectual rigor they might require, and thus can only be addressed via guest lectures, taking valuable time away from main topics to be completed.
> 3. Caution must be taken against trying to overload the course with too much content. A great way to ruin a course is to overload it with content so that it loses focus.
> 4. There are ways for students in the BSc Sciences program to inform themselves of these issues via suitable choice of electives.
>   Note that this comment applies to all FMS programs.
> 5. We emphasize that time is of the essence. Just introducing more topics is not likely to make much difference unless there is sufficient time for repetition, reinforcement, and consolidation.
>
> That said, we will try to incorporate some of these topics, time permitting.
>
> …Eventually a Faculty member may be found to champion the course, as suggested by the reviewers, and teach the course. However, we will always make sure that the

course is in good hands. Future LTA/ILTA hiring in the Faculty will keep this recommendation in mind.

The teaching assistants for this course are also chosen carefully. Last year, of the two TAs one had a PhD in Physics, and the other was pursuing a PhD degree in Biology after finishing her Masters.

The course will be promoted in various ways in consultation with the Office of Adult and Continuing Education, Concurrent Education, and Brock International.

The Dean of Mathematics and Science responded:

We agree with the AD that any change in the current syllabus must be introduced after careful consideration of what seems to work best for the students. This may take a couple of cycles of the course offering. Much of the success of this course will depend not only on what is taught, but also how it is delivered. The Dean's Office would like this matter to be decided by the AD in consultation with the FMS academic advisor, the instructor of the course, and also the Chairs and Directors (or their designates) of various departments.

ARC Disposition of the Recommendation

ARC considers the recommendation to be accepted for consideration. The Committee recognizes the importance of this course to the program and the high value placed on it by the reviewers. While it may not be possible for this one course to deliver all of the additional content suggested by the reviewers, ARC encourages the program to consider how it might provide students with connections to existing campus resources which promote the topics listed.

Implementation Plan (1st Priority)	
Responsible for approving:	Program
Responsible for resources:	Program
Responsible for implementation:	Program
Timeline:	Dean of Mathematics and Science to report by the end of academic year 2020/21

Recommendation #2

Augment student advising by increasing academic advising time and providing pathways for students in the form of program templates geared toward specific employment outcomes. Use outcome data to continually update and improve templates and pathways to better advise students.

The program response from the Associate Dean stated:

> We strongly agree with the reviewers on this recommendation. However, the one academic advisor who is currently in charge of advising the BSc Sciences students, along with students in several other programs, is simply overworked, with a caseload that far exceeds that of any other academic advisor in the university. We will request the Dean's Office to work together with the Provost to increase the number of advisors. The need for an increase in the advising component is also warranted by a significant increase in recent years in the number of international students in our Faculty.
>
> The Associate Dean will work with the academic advisors to create various pathways, including one that provides the fourth year research opportunities for the Honours program, geared towards specific employment outcomes for the BSc Sciences students. We will add a program note to the BSc Sciences calendar referring to these pathways which will be clearly laid out in the program web page: https://brocku.ca/programs/undergraduate/sciences/

The Dean of Mathematics and Science responded:

> The Dean's Office will work with the Provost to secure additional resources for increasing the academic advising component to address the needs of the BSc Sciences students as well as the FMS international students.

ARC Disposition of the Recommendation

ARC considers the recommendation to be accepted and in the process of implementation. Although hiring is outside the jurisdiction of the Committee, ARC recognizes that the program is working on ways to augment student advising in addition to advocating for additional advising resources.

Implementation Plan (1st Priority)	
Responsible for approving:	Program
Responsible for resources:	Program
Responsible for implementation:	Program
Timeline:	Dean of Mathematics and Science to report by the end of academic year 2020/21.

Recommendation #3

Develop a robust method to track outcomes for BSc Sciences students to provide a better understanding of student outcomes and aid in program improvement.

The program response from the Associate Dean stated:

> Tracking of students in this program is somewhat difficult compared with that for other programs in the Faculty. In principle, each student in this program may end up following a path unique to themselves. Many students who start their university studies in this program in year one, may join another program of their choice later and graduate from that chosen program. Conversely there are students who are placed in this program for various reasons in year 2 or 3, for not being able to maintain the standard set for their chosen program, or of their own volition as their personal situation may change. Figures related to bulk data may not reveal the true picture as to the success or failure of the program.
>
> Essentially we need to track the trajectory of each student who joins this program in year one or later. That is the only way we will know how the program is serving our students. We will discuss this issue with both the Registrar's Office and the Office of Institutional Analysis to see how meaningful and robust tracking can be achieved.

The Dean of Mathematics and Science stated:

> The FMS academic advisor and the Associate Dean will work with the Institutional Analysis Office to improve the tracking of the BSc Sciences students. With additional academic advisor(s) in place, a more thorough tracking of these students should be possible.

ARC Disposition of the Recommendation

ARC considers the recommendation to be accepted and in the process of implementation. The Committee understands that the unique nature of the program will require some time to develop a robust method to track outcomes.

Implementation Plan (2nd Priority)	
Responsible for approving:	Program
Responsible for resources:	Program
Responsible for implementation:	Program
Timeline:	Dean of Mathematics and Science to report by the end of academic year 2021/22.

D. Summary of Recommendations:

First Priority:
Recommendations 1,2

Second Priority:
Recommendation 3