

Final Assessment Report

Biological Sciences

Graduate and Undergraduate Programs (reviewed 2017-19)

A. Summary

1. The Department's Self Study was considered and approved by the Senate Academic Review Committee as follows: Part I on October 24, 2018 and Part II (Appendices) on Dec 5, 2018.
2. The Review Committee consisted of two external reviewers: Joanna Freeland (Trent University) and Suha Jabaji (McGill University) and an internal reviewer, Joanne Crawford (Brock University).
3. The site visit occurred on January 6-8, 2019.
4. The Reviewers' Report was received on January 30, 2019.
5. The Senate Undergraduate Program Committee response was received on March 6, 2019.
6. The Department's response was received on March 13, 2019.
7. The Senate Graduate Studies Committee response was received on April 2, 2019.
8. The Dean of Graduate Studies response was received on April 10, 2019.
9. The Dean of Mathematics and Science response was received on April 16, 2019.

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

The academic programs offered by the Department of Biological Sciences which were examined and rated as part of the review were:

Program(s)	Excellent Quality	Good Quality	Good Quality with Concerns	Non-Viable
PhD Biological Sciences		x		
MSc Biological Sciences		x		
BSc (Honours) Biological Sciences		x		
BSc (Honours)/BEd Biological Sciences		x		
BSc (Honours) Biomedical Sciences		x		
BSc (Honours) Biochemistry		x		
BSc (Honours) Biochemistry Co-op		x		
BSc with Major in Biological Sciences		x		
BSc (Pass) Biological Sciences		x		
BSc (Pass) Biochemistry		x		
Combined (Honours and Pass) in Biological Sciences with: Chemistry, Geography, Mathematics, Psychology, Earth Sciences, Physics		x		
Minor in Biological Sciences		x		

B. Strengths of the Program

The reviewers noted the following strengths:

The Department of Biological Sciences continues to be a leader in basic science and provides quality undergraduate and graduate programs as documented in the self-study document. The strength of faculty members, their research output, awards and recognition is mentioned under section 5.6.2. The excellence in their research programs attracts undergraduate students. Faculty and staff work together extremely well in this department. Teaching by permanent faculty is supplemented by essential contributions from an Instructional Limited Term Appointment, four senior lab demonstrators and an online course coordinator, all of whom have PhDs. Senior demonstrators additionally teach courses as sessional instructors. Both research and teaching in the department are enhanced by collaborations, cross-listed courses, and cross-appointments with faculty members from other units (Chemistry, Earth Science, Geography, Psychology, and programs within Applied Health Sciences).

Undergraduate program: One of the strengths of the undergraduate program is the lab experience to which undergraduate students are exposed. The Department prides itself for its students' preparation in basic hands-on labs dealing with biology and molecular biology. Their students are benchmarked against students of U of Toronto. The B.Sc. Honours program is another strength of the department. Students are prepared with a strong foundation in biological science disciplines and lab experience. Many of the undergraduate students continue on to do graduate degrees.

The Biomedical sciences program attracts strong students. In terms of curricula and benchmarked against other universities in Ontario (e.g., U of Ottawa) it is well subscribed and offers courses that cover a broad range of subjects related to biomedical sciences and biological sciences. The program has courses that focus on innovation and creativity in community health, epidemiology, and human genome courses. These courses prepare students in biomedical research or professional programs in health sciences.

On-line courses are well subscribed; they are developed and prepared by one dedicated on-line course Administrator who works exclusively on Biology courses.

Graduate program: Based on the interview, students recommend the graduate program based on their enriching experience, access to common lab equipment, helpful technicians and stimulating atmosphere. Student stipends are greater than those provided by some other Ontario universities, and students are supervised by permanent faculty members who are well-funded, thereby allowing cutting edge and innovative research to be executed. The graduate program offers a unique research opportunity in grape and winery research. This research is affiliated with the internationally recognized Cool Climate Oenology and viticulture Institute (CCOVI).

C. Opportunities for Improvement and Enhancement

Recommendation #1

Develop a strategic and business plans to ensure viability and sustainability of the department for the next 5-10 years. Consider new programs that could provide an additional revenue stream to the department. These could include a specialization in lab skills (i.e. Lab Skills Plus could become a minor/specialization that forms part of the students' degree (e.g. BSc in Biological Sciences with specialization in Laboratory Analyses) instead of the current practice which is to note its completion on student transcripts similar to a co-curricular record), and a course-based Master's that did not compete with the research-based Master's.

In its response, the Department stated:

The reviewer's idea of a modified Lab Skills plus "program" is very interesting. Arising from their suggestion, we are currently investigating the idea of developing new Lab Skills plus streams, one aimed at graduate students, one at undergrad students and another at high school teachers. We agree that these programs have significant pedagogical value while contributing to community outreach, experiential learning, and potentially creation of new revenue streams for the department.

We will look into the potential of developing a course-based MSc program, though this may be of limited value in Biological Sciences alone. Perhaps there is an opportunity to partner with Computer Science to provide a course-based MSc in big data.

We are currently in the midst of a strategic planning exercise that is focusing on overhauling our undergraduate and graduate programs. Of primary concern is the replacement of retiring faculty members. We take the reviewers' advice to heart concerning the business plan aspect of our strategic planning.

The Faculty Dean stated that:

The Dean's Office strongly supports the initiatives being taken by the department in mounting the Lab Skills Plus stream, one at the undergraduate level and another at the graduate level. The department is currently considering the option to provide Lab Skills courses to high school students and teachers in separate packages.

The department should also explore the possibilities of mounting low cost and high enrolment courses/programs to offset the deficit.

The Dean's Office will be providing a one-time grant of \$10,000.00 to lift such initiatives off the ground.

A CRC Tier II position has been recently allocated jointly to the departments of Biology and Computer Science. If Brock is able to attract a suitable CRC candidate, a course-based MSc program delivered jointly by Biology and Computer Science should become feasible.

The Dean of Graduate Studies stated:

I think this idea [course-based Master's degree] has merit, however, the department will need to consider very carefully the nature of the degree. There is an effort underway at the University to develop more "professional" type Masters degrees. To the extent that the department can create such a degree or, perhaps, partner with another unit to create such a degree, then I support this recommendation.

The Senate Undergraduate Program Committee (UPC) stated:

UPC supports the notion (Recommendation 1) that the Department develop a strategic plan, particularly in light of the University's new strategic plan, along with the corresponding facultywide strategic plan. While UPC supports the further development of the Lab Skills program, its current structure would not permit it to be included as a Minor. There was concern with the notion that this might be viewed as a "revenue stream". The Department may wish to have further consultation with the Dean to better understand the parameters and impacts of the activity based budget model.

The Senate Graduate Studies Committee (SGSC) stated:

The notion of a course-based Master's is acceptable; however, there should be pedagogical reasons and an academic rationale for doing so. Basing this on revenue generation alone is not acceptable.

ARC Disposition of the Recommendation

ARC considers the general recommendation to develop a strategic and business plan to be accepted and in the process of implementation. The Committee understands that the Department is already investigating the idea of a Lab Skills Plus stream and is willing to consider the potential of developing a course-based option in the MSc program.

Implementation Plan (1st Priority)	
Responsible for approving:	Department
Responsible for resources:	Department
Responsible for implementation:	Department
Timeline:	Dean of Mathematics and Science to report by the end of academic year 2019/20

Recommendation #2

Acquire additional academic staff

In its response, the Department stated:

We know this recommendation will be deemed “outside the purview” of ARC as it has a financial impact. Regardless, we would like to point out that this is a continuing issue which is highly related to previous recommendations for additional administrative staff positions from prior self-study exercises. With the existing level of administrative support, it remains difficult for us to maintain our programs, and near impossible to support new initiatives at the university like the proposed Engineering programs.

The Faculty Dean stated that:

The Dean’s Office can/will consider this option if and when the required resources become available.

ARC Disposition of the Recommendation

ARC considers the recommendation to be not accepted as it lies outside of the Committee’s jurisdiction. The Committee expects that the Department will continue to advocate through normal channels for staff resources.

Implementation Plan

Recommendation not accepted.

Recommendation #3

Develop a user fee plan to ensure the sustainability and functions of research equipment while enhancing teaching lab options.

In its response, the Department stated:

Although some specific courses have had challenges with equipment, in general we have been doing quite well with keeping our laboratory equipment up to date. The Dean has been consistently generous with funding for teaching equipment and we believe we have state of the art equipment in most of our labs. With respect to “user fees”, this may be a tricky issue as the university has regulations in place to make sure that equipment purchased for teaching is actually used for teaching. This may limit our ability to charge user fees to researchers who wish to use equipment acquired for teaching.

The Faculty Dean stated that:

The Dean’s Office will leave it to the department to decide whether and how to implement the “user fee” option.

The Dean of Graduate Studies stated:

This is largely directed at the sufficiency of labs for undergraduate courses. However, a recognition of the opportunity costs associated with lab use is consistent with the University’s efforts to recognize space costs, so I support this recommendation.

The Senate Undergraduate Program Committee stated:

There was some concern about the impact of downloading such fees onto students, and it was also noted that any fees will need to be identified in the calendar through the usual submission process.

The Senate Graduate Studies Committee stated:

In reference to user fees, lab fees are acceptable provided that these are clearly identified in the calendar. In addition, SGSC would like to emphasize that such fees should cover specialist equipment, not simply be a downloading of basic costs onto students.

ARC Disposition of the Recommendation

ARC considers the recommendation to ensure the sustainability and functions of research equipment to be already current practice. The Committee understands that the Department is well-aware of its options when it comes to the best use of its equipment for both research and teaching, including the possibility of user fees.

Implementation Plan

Already current practice. No action required.

Recommendation #4

Create an administration HUB (service point) to streamline administration support

In its response, the Department stated:

These are great ideas and we support them completely.

The Faculty Dean stated that:

The Dean's Office will let the Departments of Chemistry and Biology decide whether and how to implement this recommendation.

The Dean of Graduate Studies stated:

I believe there are many synergies that could lead to cost savings and a better graduate student experience if the Biological Sciences and Biotechnology GPD roles were combined under the supervision of a single GPD. Given the relative sizes of these graduate programs, this could be done.

The Senate Graduate Studies Committee stated:

SGSC supports the streamlining (or combining) the responsibilities of the two GPDs, particularly as the goal seems to be to enhance delivery of services to students.

ARC Disposition of the Recommendation

ARC considers the recommendation to be accepted and in the process of implementation.

Implementation Plan (1st Priority)

Responsible for approving:	Department
Responsible for resources:	Department
Responsible for implementation:	Department
Timeline:	Dean of Mathematics and Science to report by the end of academic year 2019/20

Recommendation #5

Track your undergraduate and graduate employment status

In its response, the Department stated:

Another excellent idea that, again, requires administrative support to make happen. Absolutely we should be in a position where we know what our graduates are doing. However, we have barely enough administrative support to address the immediate needs of our current students (see recommendation #2). However, this is an important point and one we will implement as much as we are able.

The Faculty Dean stated that:

The FMS Graduate Administrative Assistant and the Outreach and Communication Officer will work with the department and Brock Alumni and Donor Relations Office to implement this recommendation to the extent possible.

The Dean of Graduate Studies stated:

In general, this is a good idea that would provide important data for many groups on campus. Perhaps, there could be some coordination with Alumni Relations.

ARC Disposition of the Recommendation

ARC considers the recommendation to be accepted and in the process of implementation. The Committee encourages the Department to consult and coordinate with relevant Faculty and campus-wide resources such as Alumni and Donor Relations.

Implementation Plan (1st Priority)

Responsible for approving:	Department
Responsible for resources:	Department
Responsible for implementation:	Department
Timeline:	Dean of Mathematics and Science to report by the end of academic year 2019/20

Recommendation #6

Facilitate the ability of students to communicate concerns directly to the Chair by giving them representation at departmental meetings and on search committees.

In its response, the Department stated:

The departmental committee is supposed to have representation from both undergraduate and graduate students. This is part of our rules and regulations. In years past we have had individual student representatives for year 1,2,3 and 4 as well as graduate student representatives. In the past few years we have been lax in appointing the undergraduate representatives and moving forward, we will work to ensure that we have at least 2 undergraduate student representatives on the committee.

The Faculty Dean stated that:

The Dean's Office supports the idea of reinstating the student representatives in the departmental committee.

The Dean of Graduate Studies stated:

This is a recommendation that has been put forward by external reviewers for other units. I believe this is a good idea that supports the University's efforts to embrace diversity and provide enriching experiences for students. I would suggest that both a graduate and an undergraduate representative be sought, realizing the challenges associated with small numbers of students to draw from.

The Senate Graduate Studies Committee stated:

The recommendation to allow students representation at departmental meetings and on search committees should explicitly apply to Graduate students as well as undergraduate.

ARC Disposition of the Recommendation

ARC considers the recommendation to be accepted and in the process of implementation. The Committee understands that this has been past practice for the Department.

Implementation Plan (1st Priority)

Responsible for approving:	Department
Responsible for resources:	Department
Responsible for implementation:	Department
Timeline:	Dean of Mathematics and Science to report by the end of academic year 2019/20

Recommendation #7

Develop opportunities for graduate students to be exposed to international research experience

In its response, the Department stated:

Many of our graduate students are involved in international research through their supervisor's collaborations. We could take more advantage of these international research collaborations to make sure our students have a chance for international travel and visits to collaborators laboratories.

The Faculty Dean stated that:

This matter depends entirely on the research funding available to the Faculty members and their collaboration with other scientists around the world.

The Dean of Graduate Studies stated:

The Faculty of Graduate Studies provides conference travel support for graduate students who are presenting research at both national and international conferences, however, it does not have funding to support subsistence and/or travel for students to spend time in internationally- based labs. I support this recommendation but believe that we would need to seek additional funding to operationalize this.

ARC Disposition of the Recommendation

ARC considers the recommendation to expose graduate students to international research experience to be current practice. The Committee encourages the Department to advertise this more effectively to students as they may not be fully aware of these opportunities.

Implementation Plan

Current Practice.

Recommendation #8

Provide clarity on the budget model and provide assurance that the five pending faculty retirees will be replaced with tenure-track faculty.

In its response, the Department stated:

It is indeed exceptionally unfortunate that the new accounting approaches have created the illusion of a budget deficit, while instituting an accounting system where research success and the creation of experiential learning opportunities are both punished by charges to the department and faculty. It is certainly difficult for the department to function in the face of this system which is in direct conflict with the strategic desires of Brock University to be “comprehensive” and to increase the amount of externally funded research on the campus. Morale will continue to decline until the university steadfastly dedicates itself to the research enterprise and actually rewards individuals, departments and faculties for success in acquiring external funding for experimental research. The misalignment between the universities strategic desires and its assessment tools makes it near impossible for us to plan a future including growth of any kind.

The Faculty Dean stated that:

The present university budget model is not related to the research activities of the faculty members. The revenue is based on course enrolments only. The Faculty/Departments end up paying for the cost of the space they need for research, in addition to every other research-related cost, including funding graduate students. The Office of Research Services currently does not provide any indirect cost related to research.

ARC Disposition of the Recommendation

ARC considers the recommendation to be not accepted as it lies outside of the Committee’s jurisdiction. The Committee understands that clarity on the budget model and faculty renewal would begin with the Dean’s Office as the Faculty budget is administered by the Dean.

Implementation Plan

Recommendation not accepted.

Recommendation #9

Merge Biology and Biotech graduate programs

In its response, the Department stated:

Students do like the branding of the Biotech graduate program. Merging the administration of the two programs is a good idea, but since the actual resources associated with the two programs is restricted to one half-course teaching relief each, this would amount to a savings of just about \$7000.

The Faculty Dean stated that:

The department should engage on a long term planning of this recommendation. Some advantage may be there in streamlining/merging the administrative support of the two programs, as suggested in Recommendation #4. This matter will be left to the consideration of the Chemistry and Biology departments.

The Dean of Graduate Studies stated:

I find merit in this suggestion since I believe there are potential synergies and also resource savings. It might also provide support for achieving the goal of providing a greater variety of courses for graduate students.

The Senate Graduate Studies Committee stated:

The recommendation of merging the graduate programs of biology and biotechnology is supported by SGSC as it addresses the oft-mentioned resourcing issues while keeping a focus on the needs of students.

ARC Disposition of the Recommendation

The Committee understands that folding the two standing programs into one might not be the only solution to issues with resources. ARC considers the recommendation to merge some resources for the two programs to be accepted.

Implementation Plan (2nd Priority)

Responsible for approving:	Department
Responsible for resources:	Department
Responsible for implementation:	Department
Timeline:	Dean of Mathematics and Science to report by the end of academic year 2020/21

Recommendation #10

Streamline university calendar to better reflect which courses are offered annually or biannually.

In its response, the Department stated:

We have been lax in deleting old courses and will work on this issue. We can also add notes to the program to highlight a number of courses which traditionally rotate on a biannual basis.

The Faculty Dean stated that:

Several departments within the FMS face the problem of cycling their courses on a biannual basis, either because of low enrolment or lack of availability of instructors, whose teaching loads are dictated by BUFA regulations. A program note in the calendar indicating the list of such courses should address the concern raised by the reviewers.

The Dean of Graduate Studies stated:

This is a challenge given the mechanics of how calendar changes are put “into print”. Efforts are underway to examine how to make calendar changes in a timely fashion.

The Senate Graduate Studies Committee stated:

There are already processes in the FHB for the deletion of graduate courses after five years of not being offered. The graduate calendar quite explicitly lists option courses for upcoming years.

The Senate Undergraduate Program Committee stated:

...language does exist to identify and remove any courses that have not been offered by a Department in the past three years. It is not viable for UPC to remove these courses proactively on an annual basis, and it is important to note that the Academic Timetable clearly lists courses available in a given year. The process of not offering all courses in a program in a given year is common across the University, and in other Universities. UPC does suggest that, as a committee, it will look into ways of better identifying courses that have not been offered for three years and having these removed.

ARC Disposition of the Recommendation

ARC considers the recommendation to be accepted and in the process of implementation.

Implementation Plan (1st Priority)

Responsible for approving:

Department

Responsible for resources:

Department

Responsible for implementation:

Department

Timeline:

Dean of Mathematics and Science to report by the
end of academic year 2019/20

Recommendation #11

The administration provide funding for a Departmental retreat to allow faculty and staff to conduct a thorough assessment of the department (including curriculum, workloads, future plans), to boost morale, and to identify ways in which colleagues can be more supportive and collaborative.

In its response, the Department stated:

Providing funding for a retreat would be nice, but again this will be deemed “outside the purview of ARC”. However, this is an excellent recommendation and we will do this on our own regardless of funding.

The Faculty Dean stated that:

The Dean’s Office will consider funding such retreats for the departments on a case-by-case basis. Departments will have to justify the need, specifying concrete outcomes of such a retreat.

The Dean of Graduate Studies stated:

This is not within my purview, although I will note that Department Retreats can be very helpful for future decision-making and morale building.

ARC Disposition of the Recommendation

ARC considers the recommendation to undertake a Departmental retreat to be accepted. The Committee does not accept the recommendation that the administration provide funding as this lies outside of its jurisdiction. It is expected that the Department will proceed through normal channels of advocacy for the resources required.

Implementation Plan (1st Priority)	
Responsible for approving:	Department
Responsible for resources:	Department
Responsible for implementation:	Department
Timeline:	Dean of Mathematics and Science to report by the end of academic year 2019/20

D. Summary of Recommendations:

First Priority:

Recommendations 1,4,5,6,10,11

Second Priority:

Recommendation 9

Not Accepted:

Recommendations 2,8

Not requiring further action:

Recommendations 3,7