

Final Assessment Report

Biotechnology

Graduate and Undergraduate Programs (reviewed 2018-19)

A. Summary

1. The Department's Self Study was considered and approved by the Senate Academic Review Committee on December 5, 2018.
2. The Review Committee consisted of two external reviewers: John Vederas (University of Alberta) and Joelle Pelletier (University of Montreal) and an internal reviewer, Wendy Ward (Brock University).
3. The site visit occurred on March 19-21, 2019.
4. The Reviewers' Report was received on April 18, 2019.
5. The Senate Undergraduate Program Committee response was received on April 30, 2019
6. The Department's response was received on May 6, 2019.
7. The Senate Graduate Studies Committee response was received on May 10, 2019.
8. The Dean of Graduate Studies response was received on May 13, 2019.
9. The Dean of Mathematics and Science response was received on May 23, 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 Centre for Biotechnology which were examined and rated as part of the review were:

Program(s)	Excellent Quality	Good Quality	Good Quality with Concerns	Non-Viable
PhD	X			
MSc	X			
BSc (Honours)	X			
BSc (Honours) with co-op	X			
BSc with Major	X			
BSc (Pass)	X			

B. Strengths of the Program

The reviewers noted the following strengths:

The Biotechnology Program is an interdisciplinary collaborative effort between the Biology and Chemistry Departments in a rapidly expanding area that has great impact in medicine, agriculture and related fields. The program encompasses both undergraduate (B.Sc.) and graduate (M.Sc. and Ph.D.) studies in an area where there is great demand for highly qualified personnel by both academia and industry. As a result, this well-established program has an excellent record of post-graduation placement for both undergraduates and graduate students as well as for postdoctoral fellows (see additional Appendix documents).

The Biotechnology Program at Brock stands out from comparator programs in being well-balanced between the disciplines of Chemistry and Biology in addition to offering courses that are specific to the discipline. At the undergraduate level, in addition to a broad range of courses, there is an active and well-attended Co-op program as well as an honours thesis opportunity. The participating students are exposed to a broad range of multidisciplinary techniques and concepts. They are uniformly enthusiastic about the program and praise it highly. The participating faculty are well-funded by external grants and are recognized for their research published in peer-reviewed journals. They include Canada Research Chairs in both Chemistry and Biology. The strong commitment to research is reflected in the emphasis placed on undergraduate and graduate research within the program.

A core strength of the Biotechnology Program is the excellent collaboration between the Chemistry and Biology departments, clearly visible at the levels of teaching, research and administration. As a collaborative program between the Chemistry and Biology departments, there is minimal, if any, additional cost beyond that going to support the individual departmental units themselves. The administrative, support and academic staff in the two departments are dedicated to making the program a success. The outcome is certainly much greater than the sum of the parts.

C. Opportunities for Improvement and Enhancement

Recommendation #1

If space permits, the formation of an undergraduate “Biotechnology Club” with a room allocation could further enhance communication among students in this program.

In its response, the program stated:

We agree with the reviewers that communication among students within the program is important and that an undergraduate club can promote this. There is already a club named Molecular Research Technologies that is open to Biotechnology undergraduates. Indeed, the current president and treasurer of the club are both Biotechnology students. Because of the small numbers of students in the Biotechnology program we feel it would be more productive to support the existing club rather than creating an additional one. We have had discussions with the current members of the club about how best to encourage more first- year students to get involved (see recommendation 4). Providing dedicated space to the club is difficult but registered undergraduate clubs can book rooms for the duration of the term when they are not in use for teaching.

The Faculty Dean stated that:

The Dean’s Office agrees with and is satisfied with the unit response.

The Dean of Graduate Studies stated:

This is aimed at undergraduates so not within the purview of the Dean, Faculty of Graduate Studies. However, to the extent that graduate students could participate as mentors in this club, I strongly support this recommendation.

ARC Disposition of the Recommendation

ARC considers the recommendation to be accepted and in the process of implementation. The Committee expects that the Centre is best-positioned to determine strategies for an effective Biotechnology Student Club and a suitable meeting space.

Implementation Plan (1st Priority)

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

Recommendation #2

A plan for replacement of senior Biology and Chemistry faculty who may consider retirement in the next years should be considered.

In its response, the program stated:

Because the faculty in the Centre are appointed to either Biology or Chemistry the plans for faculty replacement must be developed within the respective departments. Both departments have struck committees to plan hiring strategies and representatives of the Centre sit on both committees. However, two factors beyond our control make this planning difficult. First, the procedures for the allocation of Canada Research Chairs mean the Faculty of Math and Science can only recommend possible areas of allocation. For recent CRC appointments our recommendations, and those of a review committee, in which one Biology and one Chemistry faculty member participated, have not been followed by the upper administration. Second, the current budget situation means that no vacant faculty positions can be filled at the moment and it is unclear how long this situation will continue.

The Faculty Dean stated that:

The Dean's Office will keep the recommendation in consideration and follow through when the fiscal conditions permit the recommended hiring.

ARC Disposition of the Recommendation

ARC considers the recommendation to plan for faculty renewal to be accepted and in the process of implementation. The Committee recognizes that hiring decisions lie outside of its purview and expects that the Centre will proceed through normal channels of advocacy for faculty resources.

Implementation Plan (1st Priority)

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

Recommendation #3

We suggest prioritizing acquisition of modern instrumentation to give an edge to the teaching labs: fermentation and modern automation.

In its response, the program stated:

Three members of the Centre ... have been tasked with writing a Fed Dev grant application that will establish a state-of-the art testing, prototyping and early stage manufacturing centre at Brock. Among the various pieces of equipment being planned for the centre is a 2L benchtop fermentor with computer control. If the application is successful, this equipment will be available for student training. In the event that the Fed Dev grant is not successful the Centre, together with the Chemistry Department, will lobby the Dean for funding for such equipment.

The Faculty Dean stated that:

The Dean's Office hopes that the FedDev application will be successful. In case the application is not successful, the Dean's Office suggests that the unit will explore alternate ways of raising the required funds, e.g., via NSERC RTI and CFI Grant applications.

The Dean of Graduate Studies stated:

I am in support of faculty members working together to share resources necessary to acquire the instruments that support both research and teaching.

ARC Disposition of the Recommendation

ARC considers the recommendation to plan for the acquisition of modern instrumentation to be accepted and in the process of implementation. The Committee recognizes that equipment purchase decisions lie outside of its purview and expects that the Centre will proceed through normal channels of advocacy for these resources.

Implementation Plan (1st Priority)

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

Recommendation #4

An additional group orientation during 1st year, prior to entering the undergraduate Biotechnology program could be helpful for new students. This could help students be proactive about seeking support of the guidance person when they need it and for planning future years.

In its response, the program stated:

This is an excellent recommendation that could also encourage students to get involved in the undergraduate club. The Centre will work with the Chemistry and Biology academic advisors and the MRT club to explore ways that such a session could be offered.

The Faculty Dean stated that:

The Dean's Office supports this recommendation and hopes the unit will take the initiative to implement the recommendation for the coming Fall semester.

The Dean of Graduate Studies stated:

This is a good recommendation that makes sense but not within the scope of the Dean, Faculty of Graduate Studies.

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

D. Summary of Recommendations:

First Priority:

Recommendations 1,2,3,4