

FINAL ASSESSMENT REPORT
Department of Biology
Faculty of Science
Cyclical Review Period: 2017–2018
Date: October 26, 2022

I. Evaluated Programs

- Master of Science Biology
- Doctorate in Philosophy Biology

II. Evaluation Process (outline of the visit)

This Final Assessment Report on the above programs was prepared from the following documents: 1) the self-study report produced by the academic unit; 2) the report of the external evaluation following the virtual visit; 3) the responses prepared by the program director, Vance Trudeau, and by the Dean, Faculty of Science, Louis Barriault.

The virtual site visit took place on December 9, 2021, and was conducted by the following two evaluators: 1) Nusha Keyghobadi, Western University and 2) Marc Amyot, Université de Montréal.

During their virtual visit, the external evaluators met with the following individuals and groups: 1) full-time professors; 2) Jeremy Kerr, Chair, Undergraduate Studies and Director, Biology Program; 3) Vance Trudeau, Director, Graduate program in Biology, 4) Tuan Bui, Director, Biology program; 5) Odette Laneuville, Director, Biomedical Sciences program; 6) eight students from the Biology Graduate Student Association, including two international students; 7) members of the administrative and support staff; 8) Louis Barriault, Dean, Faculty of Science, 9) André Beauchemin, Vice-Dean, Graduate Studies and Entrepreneurship; 10) administrators and staff from the core facilities and institutes; 11) Sylvie Lamoureux, Associate Vice-Provost, Graduate and Postdoctoral Studies.

The visit was carried out virtually due to the SARS-CoV-2 pandemic. The reviewers were provided a comprehensive self-study brief that had been previously presented and discussed at the Department Assembly prior to revision. Furthermore, the reviewers had virtual tours of the following core facilities: 1) Laboratory for the Analysis of Natural and Synthetic Environmental Toxins; 2) Molecular Biology & Genomics facility; 3) Cell Imaging & Cytometry facility; 4) Physiology & Genetics of Aquatic Organisms facility, and 5) Plant Biology greenhouses & growth chambers.

III. Summary of Reports on the Quality of Programs¹

1. EMPHASIZING THE STRENGTHS AND IDENTIFYING CHALLENGES

STRENGTHS

- Strong research environment matching that of other research-intensive graduate Biology programs at major Canadian universities.

¹ Based on excerpt, often verbatim, from the self-study, the external evaluation report, and the program and decanal responses.

- Mentoring of very good quality by faculty members and strong involvement of the thesis advisory committees.
- The National Capital location promotes the participation of government researchers on thesis advisory committees, co-supervision of students, research collaborations, and grant applications.
- The Ottawa-Carleton Institute of Biology (OCIB) allows strong inter-university faculty participation on thesis advisory committees and the sharing of graduate courses, and is very appreciated by faculty and students.
- Strong sense of engagement of the student body.
- State-of-the-art core facilities supported by highly skilled technical staff.
- At the Ph.D. level, near gender parity.

CHALLENGES

- The number and range of graduate courses offered each year are limited. The structure and the evaluation methods for the seminar course were deemed inappropriate by faculty members and students. The content of the seminar course is unsatisfactory. Hands on experience through laboratory courses is solicited. All these issues are presently being looked at by the Department.
- Students expressed the need for clearer and timely communications about academic and administrative requirements, and revised funding packages.
- Building space seems to be a limiting factor in the potential for expansion of the graduate programs.
- The connection with the Franco-Ontarian community could be strengthened.

2. PROGRAM OBJECTIVES

- Both the program objectives and the program learning outcomes are clearly defined.
- The MSc and PhD programs in Biology are contributing to the strategic axes on health and sustainable development. The external reviewers note that a “significant part of the research conducted by graduate students is interdisciplinary and involves national and international collaborations. Some research projects take into account Indigenous Knowledge to enhance both research and learning outcomes.”
- The connection with the Franco-Ontarian community seems to be underdeveloped.
- It is expected that the current efforts of the program, namely through the revised seminar course, will improve training in written and oral communications, as well as ethics.

3. CURRICULUM AND STRUCTURE

- “The admission requirements for this program are similar to, and consistent with, those for other graduate programs in Biology in Canada.” Faculty members are very satisfied with the quality of the students and the time to completion appears to be similar to that of other thesis-based graduate programs in Biology.

- Similarly, the program's learning outcomes and structure are comparable to those of other Biology graduate programs in Canada. The learning outcomes are frequently attained through activities outside of courses.
- The program includes a broad list of courses, but only a few are offered each year. In order to provide new students with correct information, it will be important for the unit to eliminate courses that it believes it will no longer be able to offer, and update to the new relevant courses that may be added.
- The Ottawa-Carleton Institute of Biology broadens the scope of courses and mentoring for the students.
- The completion time for the program seems to be above average, and calls for checking teaching assistant duties.

4. TEACHING, LEARNING AND EVALUATION METHODS

- “The modes of delivery used in the programs are consistent with most graduate programs in the field (...). These modes seem appropriate and effective.”
- Since the programs evaluated are research intensive, important aspects of the evaluation are carried out by the supervisor and thesis advisory committee, which are strong components of the programs.
- “With the presence of government agencies in the area, there could be more effort on providing more targeted transferable skills.”

5. STUDENT EXPERIENCE AND GOVERNANCE

- Student satisfaction with research, thesis advisory committees, core facilities, and course quality is very high. Whereas the number and diversity of courses, as well as administrative support for navigating the programs, could be improved. Students also expressed the need for clear and timely instructions regarding their program requirements. The graduate guidebook should not be under the sole responsibility of the students. It was also mentioned that navigating the websites is difficult.
- The seminar course is a well-known source of student dissatisfaction. However, the program's leadership is currently revising it.
- Several concerns were raised by the students during the interviews. Stipend amounts and the details about the funding packages are not communicated well. “Overall, there is a sense among students that despite the entrance scholarship program, funding packages are not adequate.”, which tends to limit socio-economic diversity in the student body. Funding seems to be more challenging for international students that the program tries to attract at the MSc level. This is recognized by the program and the faculty and will be addressed in the next evaluation cycle.
- The external reviewers “were very impressed with the students’ strong sense of engagement with the Department and with their graduate student society”.

6. PHYSICAL AND HUMAN RESOURCES

- Students have access to well-equipped core facilities maintained by highly skilled technical staff.

- “The quality of faculty in the program is very high, and faculty clearly have the expertise and motivation to sustain a very strong graduate program, promote innovation, and foster an appropriate intellectual climate.”
- There is concern that the program's available space is limiting the quality and number of professors that can be recruited, thereby limiting the program's growth. New faculty members may be required for future developments such as additional graduate courses or a professional master's degree.
- According to the external evaluation, the Faculty Graduate Office may be understaffed, which explains the difficulties in communicating with students on time.

IV. Program Improvements²

The programs under evaluation are in conformity with the standards of the discipline. The following recommendations aim at maintaining or increasing the level of quality already achieved by the programs.

- **Recommendation #1:** Improve graduate course offerings
- **Recommendation #2:** Enhance administrative support and communication capability of the graduate office to graduate students and departmental staff and faculty
- **Recommendation #3:** Ensure continued high-quality services of core facilities
- **Recommendation #4:** Promote links with local government resources
- **Recommendation #5:** Ensure adequate funding support to students
- **Recommendation #6:** Improve communications at all levels
- **Recommendation #7:** Investigate the possibility of a professional MSc

V. Action Plan

An Action Plan has been developed by the Director of the MSc and PhD programs of the Department of Biology, as well as the Dean's office. The leadership of the programs agrees unconditionally with recommendations #1, #2, #5 and #6. Given that additional resources, including teaching personnel, will be needed for recommendations #3, #4 and #7, the academic unit and faculty agree in principle with these recommendations.

VI. Conclusion

In their report, the external evaluators conclude that their “overall impression is of a vibrant graduate program in which excellent support for the thesis development and completion is provided by highly qualified and dedicated faculty, and by core facilities with highly skilled staff”. They praise the students for their high level of engagement. Areas for improvement have been identified. Namely, the evaluation identifies the need to broaden the offering of graduate courses and to improve on communications with students.

In view of this positive evaluation, the committee members would like to thank all the participants for the evaluation of the programs and congratulate the unit for the

² Based on the External Evaluation Report.

thoroughness of the work accomplished and the quality of the self-evaluation report, as well as that of the report produced by the external reviewers.

Schedule and Timelines

A progress report that outlines the completed actions and subsequent results will be submitted to the evaluation committee by **December 15, 2023**.

The next cyclical review will take place in no more than eight years, in **2024-2025**. The self-study brief must be submitted no later than **June 15, 2024**.

Unit Response and Action Plan

Faculty:

- Faculty of Science

Programs evaluated:

- Master of Science Biology
- Doctorate in Philosophy Biology

Cyclical review period:

- 2017-2018

Date:

- June 10, 2022

Note: This document will be submitted to the Senate, as well as the Quality Council, and will be published on the University Web site.

General comments:

On February 12, 2022 the Biology program was made aware of the External Review Report produced in the context of the cyclical program evaluation. We were extremely pleased with the positive evaluation of our graduate program. Given that the Biology graduate program has committed to providing an outstanding training and research experience, we were gratified to see that the external reviewers found that our “MSc and PhD programs were of excellent quality”, that “student satisfaction was high” and that “no major issues with the program, the learning objectives, courses or management of the programs were discovered”. The report makes 7 major recommendations (with a number internal to the main categories), of which 3 are considered high priority. We take all the recommendations seriously and feel confident that by addressing most of them where financially feasible, our graduate program will be even stronger. The recommendations and our response, produced jointly by the unit and the Faculty are included below. Note that several have already been implemented or will be implemented shortly in the coming months.

Recommendation 1: Improve graduate course offerings

Unit response: Agreed unconditionally. We are continually updating our course offerings. On some occasions, courses have been offered every second year, so sometimes they remain listed but are not offered every year. There has been a drive to expand course offerings, and the 2022-23 academic year will see several new courses. The main innovation is the new core communications course. We are now trying to navigate the transition, since some students are mid-way in their programs. This is under active discussion and planning. A new curriculum committee is under development. We have some team taught courses, and we will continue to explore this option, depending on how our student population changes.

Decanal response: Agreed unconditionally. Including graduate courses in workloads is a change that occurred during this cycle, and that addresses the root of the issue. The important growth observed at both the undergraduate and graduate level makes this a challenge. This requires strong leadership and innovation at the unit level, and support from the Faculty and University when the Department request new positions. The Faculty of Science is willing to use its envelope 2 to support the creation and support of graduate lab courses (action #3).

Priority Level*	Actions to be undertaken	Assigned to	Timeline	Curriculum change?
1	Numerous new courses have already been proposed and are now included in professor workloads. Several older courses no longer offered have been removed.	Graduate Director and co-director, and Dept Chair	Fall 2022	Yes
2	Promote team teaching and promote cross-listing of specialty undergraduate courses. Some courses already do this, but the new Graduate director will promote this. A new core course on writing and communication is being developed and implemented (C. Darveau et al.)	Graduate Director and co-director	Fall 2022	Yes
3	Create and fund officially recognized graduate lab courses linked to core facilities, with significant involvement of technicians, without additional cost to the student. Agreed to if additional resources permit. The rationale for a delay is that there are currently no funds available.	Graduate Director and co-director, Vice-Dean Research	Fall 2023	Possibly

* PRIORITY LEVEL: 1. URGENT-IMMEDIATE ACTION REQUIRED 2. IMPORTANT-ACTION REQUIRED WITHIN 18 MONTHS (MAXIMUM) 3. ADVISED: DEVELOPMENT AND STRATEGY-ACTION TO BE DISCUSSED AND MUST BE IN PLACE BY MID-CYCLE (WITHIN 4 YEARS)

Recommendation 2: Enhance administrative support and communication capability of the graduate office to graduate students and departmental staff and faculty

Unit response: Agreed unconditionally. There have been important changes in the Faculty of Science graduate office over the period covered by the cyclic program review. These include transfer from a more centralized model (Faculty of Graduate and Postdoctoral Studies) to a more decentralized model that has transformed the nature of operations performed in the graduate office. In 2018, a position of Academic Services Supervisor was added, and in 2021, the Faculty of Science added a position of academic officer using funding from its second envelope (Faculty funds, in this case used to improve student experience). Even with this additional position, the graduate office is one of the smallest / most efficient graduate offices on campus.

The graduate program in biology is one of the largest graduate programs in the faculty, which makes the role of graduate director very important for communications between the graduate office, professors and students. During the program review, the Department of Biology also concluded that different aspects of the current role of program director could be shared between two faculty members, thereby helping when communications are academic in nature. Updating the graduate handbook and ensuring that students use it is a tool to help streamline communications by providing a "go-to" source of information for graduate students.

Decanal response: Agreed unconditionally. The Faculty of Science recognizes the need and several recent changes have been made to address this (see above). In Fall 2022, the Faculty of Science will request for the new position in the graduate office to become permanent. This position is essential to handle the volume of requests from students (+25% increase in enrollment since 2015) and decentralized operations. Ensuring stability in the graduate office can be a challenge due to the current labour shortage, but the current leadership in the graduate office certainly helps.

Priority Level*	Actions to be undertaken	Assigned to	Timeline	Curriculum change?
1	Improve communication between Grad office, professors and students. This does not require additional funds	Vice-Dean Graduate studies, Director of Biology Graduate program and Chair of Dept.	Summer 2022	No
1	Hiring one person and/or ensure the stability of the current staff. This requires additional funds.	Vice-Dean Graduate studies	Fall 2022	No

* PRIORITY LEVEL: 1. URGENT-IMMEDIATE ACTION REQUIRED 2. IMPORTANT-ACTION REQUIRED WITHIN 18 MONTHS (MAXIMUM) 3. ADVISED: DEVELOPMENT AND STRATEGY-ACTION TO BE DISCUSSED AND MUST BE IN PLACE BY MID-CYCLE (WITHIN 4 YEARS)

Recommendation 3: Ensure continued high-quality services of core facilities

Unit response: Agreed in principle, but this is not related to the duties of the Graduate Director, and requires additional funding. We have several core facilities within Biology and there are constant challenges to maintain them. While they are critical to research success, and thus to our graduate program, the funding is a separate issue. These fall under the responsibility of the VP Research and Innovation, and Vice-dean Research for the faculty of Science. We will initiate discussions about how to ensure continued services as they relate to the graduate program,.

Decanal response: Agreed in principle. The Faculty of Science recognizes that core facilities can have an impact on the research performed by the graduate students in the program. High quality services by core facilities interacting closely with students improve the student experience. The responsibility of core facilities falls under the VP Research and Innovation. The Faculty of Science and Vice-Dean research (VDR) support its core facilities, for example by supporting permanent staff financially and through the VDR providing support when issues arise (e.g. HR). The Department is encouraged to make specific requests to the Dean for core facilities when specific issues arise.

Priority Level*	Actions to be undertaken	Assigned to	Timeline	Curriculum change?
2	Provide improved and stable financial support for technical staff of core facilities. This is not related to the duties of the Graduate Director, and requires additional funding.	Vice-Dean Research, Faculty of Science	Fall 2022- Winter 2023	No

* PRIORITY LEVEL: 1. URGENT-IMMEDIATE ACTION REQUIRED 2. IMPORTANT-ACTION REQUIRED WITHIN 18 MONTHS (MAXIMUM) 3. ADVISED: DEVELOPMENT AND STRATEGY-ACTION TO BE DISCUSSED AND MUST BE IN PLACE BY MID-CYCLE (WITHIN 4 YEARS)

Recommendation 4: Promote links with local government resources

Unit response: Agreed in principle, but this is already ongoing since many years. Now we strive for improvement. We have adjunct professors from Government departments who serve on graduate thesis advisory committees, and participate in supervision and graduate teaching. We have also initiated a new “Affiliate” program for external researchers to directly interact with our department.

These are: Visiting Researcher (short-term), Junior Fellow (initial three year appointment with one renewal option), Senior Fellow (five year appointment with renewal), Adjunct (initial three year appointment with renewal).

Decanal response: Agreed in principle. The Faculty of Science recognizes this as a strategic objective. This is aligned with the vision of the Faculty and of the University (i.e. objective to be more connected by 2030). The Department and Faculty have worked together on the framework for external researchers (early 2022), with the goal of facilitating participation of external researchers in activities that contribute to the academic and/or research mission of the University. The document and guidelines produced are also ensuring clarity for their participation in thesis advisory committees for example, ensuring that the academic regulations are followed, and program integrity is ensured. This document is now an example shared with other units within the Faculty.

Priority Level*	Actions to be undertaken	Assigned to	Timeline	Curriculum change?
3	Improve participation of government researchers in graduate program. This is already quite active through co-supervision, adjunct appointments etc.	Graduate director and co-director	Winter 2023	Possibly

* PRIORITY LEVEL: 1. URGENT-IMMEDIATE ACTION REQUIRED 2. IMPORTANT-ACTION REQUIRED WITHIN 18 MONTHS (MAXIMUM) 3. ADVISED: DEVELOPMENT AND STRATEGY-ACTION TO BE DISCUSSED AND MUST BE IN PLACE BY MID-CYCLE (WITHIN 4 YEARS)

Recommendation 5: Ensure adequate funding support to students

Unit response: Agreed to unconditionally. Currently the minimum guaranteed stipends are 19,500 and 20,500 for MS and PhD respectively. Many PIs provide additional support above this. Note also that many students get tuition waivers and we have a generous TA program. Nevertheless, we have been discussing at recent departmental meetings several strategies to have a stepwise increase in the minimum guaranteed support. There will be some immediate increases, followed by longer term changes. Note that research funding, which supplies other student salaries have not changed in Canada for decades. This is a financial challenge that is being actively addressed.

Decanal response: Agreed unconditionally. The Faculty of Science recognizes that student financial support is tied to student success. This results in our students having one of the best completion rates on campus. Both the Department and Faculty have met regularly with students to address this, particularly in this past year (even before inflation increased). Biology has recently voted (May 2022) to increase mandatory financial support by supervisors, and policies at the faculty level have been clarified, notably to ensure that increase that students get from teaching assistantship work be automatically transferred to the students. The department is also encouraged to compare with funding provided in other biology programs in U15 universities.

Priority Level*	Actions to be undertaken	Assigned to	Timeline	Curriculum change?
1	Revision of minimal stipends is under active study and discussion at the departmental level. Increases are imminent.	Graduate Director and co-director	Fall 2022- Winter 2023	No

Recommendation 6: Improve communications at all levels

Unit response: Agreed unconditionally. The past several years have been challenging for everyone, but communication issues pre-date the covid-19 lockdown period. With expansion of the department, we need to pay extra attention to communication. This was addressed in the report, and action items are briefly outlined below. The Biology department is a convivial environment, but we must strive for more open, clear communication at all levels. External promotion of the programs is under active discussion at the faculty level for all departments, not only Biology.

Decanal response: Agreed unconditionally. Updating the graduate handbook is seen as a strategic investment of time that helps provide answers to students. Funds are available to help promote programs externally, they can be requested through the vice-dean graduate studies.

Priority Level*	Actions to be undertaken	Assigned to	Timeline	Curriculum change?
1	Update the graduate handbook	Graduate Director and co-director with assistance from Graduate office staff	Fall 2022	No
2	Better external promotion of the programs. This will require additional funds from the faculty.	Graduate Director and Dept. Chair	Fall 2022-2023	No
3	Promote more participation by professors emerging local initiatives (BioMatters, Sci-lunches)	Graduate Director and Dept. Chair	Fall 2022	No

Recommendation 7: Investigate the possibility of a professional MSc

Unit response: Agreed to in principle, and this will likely require additional teaching personnel. There are several viable options for professional MSc and associated accreditation. The most obvious are in Ecotoxicology and related disciplines, and also Ecology and Evolution. This has been discussed over several years. The next steps is to look at the various options to expand into a professional MSc program. We recognize that there is a unique opportunity being in the Capital, where many government agencies are searching for ways to improve training of their members. We think that we can develop interesting modular courses that would appeal not only to our government colleagues, but perhaps also our students. This w be an important challenge in the coming 2 years.

Decanal response: Agreed to in principle. The Faculty of Science supports professional MSc degrees, and encourages the Department to consider academic innovation more broadly at the MSc level. A professional MSc degree is an excellent initiative that can benefit all students, and is aligned with recommendation #1. The Department and Faculty has discussed this more broadly over the recent years, particularly from the perspective that some students completing their BSc in biology or biomedical sciences (both delivered by the Department of Biology) could be interested in such program, or in shorter MSc programs currently only available at the Faculty of Medicine.

Priority Level*	Actions to be undertaken	Assigned to	Timeline	Curriculum change?
2	Discuss development of the professional MSc with members of the Dept.	Dept. Chair and Director of Graduate studies	Fall 2022-Fall 2024	Yes