

Biological Sciences

Graduate and Undergraduate Review

Year 3 (2022) - FAR Implementation Report

(reviewed 2017-19)

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.

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

Actions	Responsibility	Year One*	Year Two	Year Three
Action #1 Lab Links.	Department	O	O	
Action #2 Program development.	Department	D	T	T

Comments 2020:

Lab Skills Plus was renamed Lab Links to conform with the university's new branding policies. Lab Links has continued to expand as a fee-for-service program. This year we had 160 students enrolled at different times. Most significantly, we were just in the process of completing a package aimed at high school students coming to university when the COVID crisis hit. We have negotiated with our Dean to make this package available to incoming

On Target (T), Delayed (D), Complete (C), Complete and Ongoing (O)

students without charge so that they can acquire laboratory skills they will have missed. This will be offered this August. It will be a significant recruitment and retention advantage for us. In addition, we are about to submit an NSERC communications grant application for \$20,000 to further develop the communications aspects of Lab Links.

Other aspects of program development are not currently possible. It is important to note that, at the time of this review we had 19 faculty members and one of the main points the reviewers made was we needed more. Instead, we operated in 2019-20 down four to five faculty members due to unreplaced retirements and a member on medical leave. Our current discussion in the department has been focused not on expansion or development of new programs, as encouraged by the committee, but rather the retrenchment or elimination of existing programs in response to dwindling faculty numbers.

To illustrate the time limitations currently being experienced by department faculty members, consider the following simple quantitative analysis:

If a faculty member works 40h per week and 20% of her/his workload is devoted to administrative tasks, then this equals 8h per week for administrative tasks. For four faculty members, $4 \times 8 = 32$ h per week of administrative tasks. Since there are currently 14 full time faculty members in the department, this means that in order for the department to maintain the administrative tasks performed by the four as yet unreplaced retirees, each remaining faculty member must take on $(32/14)$, or 2.3h per week of additional tasks. This is currently happening.

We can add to this the cost of solving the above problem by hiring new faculty members. Since there was no plan in place for a staggered replacement of retirees, we are currently recruiting for three positions simultaneously. Unlike senior administrative searches that produce short-lists of 1-2 people, our short-lists have 3-5 individuals per position, which allows us to choose from a diverse selection that gives opportunities to many people and results in the best candidate for the department. This means we must interview approximately 12 (e.g. 4×3) people for the replacement positions. Each interview takes about one day and requires participation from all faculty. For each applicant, each faculty member must view two seminars and engage in one interview session, for a total of about 2.5h per applicant. $2.5 \times 12 = 30$ h per faculty member of additional time. If we spread this out over the next ten weeks, this is 3h per week per faculty member. If we add this to the additional workload faculty are undertaking of 2.3h, we are at 5.3h of additional time per week relating to our staffing situation.

In order to get to the short lists and begin to solve our problem, the nine faculty members who participated in the respective committees spent 10-20h each reviewing and ranking applications. This takes the time cost of our staffing crisis to, on average, 6-7h per week per person.

Note that all of this is occurring within the context of the COVID crisis. All faculty members in Biological Sciences moved the lecture components of their courses online for end of winter 2020 and spring/summer 2020. We are currently doing so for fall 2020. The time required for this is about 2h per lecture. Most courses have 36h of lectures, so this is an additional 72h over the next 15 or so weeks, or almost 5h per week. We can add this number

to the recruitment number to get 12h per week of total time that we are asking all of our faculty members to find, over and above normal activities.

Taken together, the numbers above clearly illustrate why it has not been possible in year 1 to attend to this recommendation. If we see staffing levels return to historical norms in subsequent years it should become possible for the department to function at a level beyond survival and thus to give attention to this recommendation and others.

Comments 2021:

- (1) A Lab Links (was called Lab Skills Plus) coordinator position (30h/week) has been funded by the Dean and approved by HR. We are in the process of hiring for this position, which will solidify Lab Links going forward. Lab Links is transitioning to a fee-based program and we anticipate several thousand dollars of profit coming from the Lab Links programs.
- (2) Development of new undergraduate programs in Applied Ecology and Cannabis Ecology is well underway. We anticipate both programs will bring in new students and new revenue, but will need resource support to implement them.

Comments 2022:

- (1) The Lab Links Coordinator has taken on the additional responsibilities of running Science Start, our Mentorship program, and our new Co-op Biological Sciences program. Both Lab Links and Science Start are generating revenue now, though both have been hindered by ongoing closures of in-person activities due to the pandemic. About \$10,000 in total revenues at this point is a good start under trying conditions. Our Mentorship program is hard to measure in terms of revenue, but we expect it is contributing to retention, which will have effects on revenue. Since our Co-op programs (e.g. in Neuroscience, Biotechnology, etc) are so popular among our students, we anticipate that offering the Biological Sciences Co-op will generate revenue via recruitment and/or retention. Finally, they are developing our Lab-in-a-Box program that will use our equipment library to make sophisticated biology labs available to local schools. This will have recruitment implications that are expected to increase revenues. During the pandemic, we have not been allowed into schools, but are hoping this restriction is relaxed in the coming school year. With the position of Lab Links Coordinator being funded, the department of Biological Sciences has provided office and teaching lab space to Lab Links for their activities.
- (2) The BSc in Applied Ecology program Statement of Intent (SOI) was approved by the Academic Review Committee (ARC) and is now progressing through to the preparation of a Program Proposal Brief (PPB). An SOI for the BSc in Cannabis Sciences program has been prepared, although several months behind, but is also expected to pass ARC. Both of these programs are anticipated to increase our total undergraduate enrolments and thus increase revenues.
- (3) We continue to discuss a course-based Master's program in Applied Ecology. Development of this was superseded by our focus on getting our undergraduate program in Applied Ecology developed. We will try to find time to get back to the MSc-level professional course-based program soon.

Recommendation #2

Acquire additional academic staff

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.

Comments 2020:

No comments

Comments 2021:

The self-defeating strategy of allowing faculty retirements without replacements in a department with steady program enrolments and growing course enrolments seems, thankfully, to have been reversed. We have been able to hire replacements and this is stabilizing the department after a period in which academic programs were put in jeopardy by inadequate resourcing.

Comments 2022:

The Department of Biological Sciences has completely turned the corner on staffing levels. We have hired new faculty members with specialties in Plant Physiology, Virology, Ecology, and Neuroscience. We have collaborated with the Department of Computer Science to apply for a CRC Tier 2 position in Computational Biology which is currently under review by the Federal Government committee. The Department has created new lab space from what was previously a lunchroom and storage room. The Department has collaborated with the new Engineering Department to create a new faculty position in Sustainable Agriculture Engineering to begin in July 2022. The Department has created lab and office space for this position. Our Department was recently successful in being granted a CRC Tier 1 position in Plant Synthetic Biology, and we will begin immediately to work to recruit an excellent candidate. Finally, we still have one retirement position to replace and are in the process of determining what specialty this should be. With the positions outlined above, we are now in a position to confidently move forward. We will be able to increase our undergraduate and graduate student enrolments, knowing we have the ability to meet their needs. We are increasing our recruitment efforts and have new programs in development. We will be increasing our grant applications and expect to see concomitant increases in indirect research cost funding from the Tri-Agencies.

Recommendation #3

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

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.

Comments 2020:

In the absence of adequate funding to run our undergraduate labs, we instituted a user fee almost 10 years ago. We have also developed Lab Links, again with user fees, as a means of offering further opportunities for skills development for our students.

Comments 2021:

User fees have been suspended, as have in-person labs, due to COVID restrictions. However, our present system of fees, which will be re-instated when we are back on campus, has stabilized our undergraduate lab equipment bank and we are in good shape at this time.

Comments 2022:

User fees were re-implemented and continue to make a big difference in the quality of laboratory experience we are able to offer. We are extremely proud of our laboratory practical teaching. Our students have been excited to be re-introduced into the labs as the pandemic takes a pause.

Recommendation #4

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

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

Actions	Responsibility	Year One*	Year Two	Year Three
Action #1 Streamline administrative support.	Department	D	C	

Comments 2020:

We have designated our Department Administrative Assistant as the administrative HUB through which all undergraduate student, staff, and faculty issues pass. A staff member was hired in the Faculty of Mathematics and Science to look after the needs of graduate students in all programs administered by Biological Sciences. This has relieved much of the administrative burden from our program directors. Further streamlining has been delayed by our inability to access campus. We will address this action item in year 2.

Comments 2021:

Administrative load has stabilized.

Comments 2022:

We have been able to hire new administrative assistants to replace our retired administrative assistant. An additional administrative assistant for the Neuroscience program has been hired and is housed in Biological Sciences. New undergraduate Academic Advisors have been hired, and one is physically present in the Department at least one day a week. Altogether, our administrative support has increased dramatically and we are now able to function at a much higher level. Once our students are back on campus full-time, they will notice and appreciate that they now have the ability to get help when needed.

Recommendation #5

Track your undergraduate and graduate employment status.

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

Actions	Responsibility	Year One*	Year Two	Year Three
Action #1 Track undergraduate and graduate employment status.	Department	D	D	D

Comments 2020:

The Department has emailed Alumni Relations to get this information and will continue to engage with this unit to gather this information. Progress has been slowed this year due to COVID issues, but we will continue to work on this in Year 2.

Comments 2021:

Progress has been delayed due to COVID.

Comments 2022:

We have had insufficient staff to implement this until now, but are beginning to do this.

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.

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

Actions	Responsibility	Year One*	Year Two	Year Three
Action #1 Recruit student representatives.	Department	D	D	D

Comments 2020:

Due to COVID restrictions, we are not having regular departmental meetings. Our current graduate student representative will defend her PhD next month and leave Brock for Woods Hole Laboratory. She will be replaced when the university re-opens and a suitable undergraduate representative will be found at that time as well.

In the meantime, graduate and senior undergraduate students working in research labs are being included in the current round of faculty hires. They will be invited to all candidate seminars and encouraged to ask questions and provide feedback.

Comments 2021:

Due to COVID restrictions, we continue to not have in-person departmental meetings. We will re-instate this with the participation of students when we are back on campus.

Comments 2022:

The Biological Sciences Department is holding a retreat this May and will invite undergraduate and graduate student representatives to it. This will be an ideal opportunity for them to contribute to our discussion.

Recommendation #7

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

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.

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

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

Actions	Responsibility	Year One*	Year Two	Year Three
Action #1 Engage in discussions with Chemistry to merge Biotech with Biology.	Department	D	D	D

Comments 2020:

We were beginning this discussion when COVID response shut down physical meetings and required a redirection of time and effort toward more immediate tasks. We will resume this discussion in year 2.

Comments 2021:

We were beginning this discussion when COVID response shut down physical meetings and required a redirection of time and effort toward more immediate tasks. We will resume this discussion in year 3.

Comments 2022:

We have not yet commenced this discussion. On the other hand, our graduate student numbers in both programs are increasing as we are replacing retired faculty members with new recruits. Thus, we expect within the next five years an ~40% increase in our total number of graduate students in both programs compared to 2019. We project 70 in each program, making it less necessary or desirable to merge programs.

Recommendation #10

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

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

Actions	Responsibility	Year One*	Year Two	Year Three
Action #1 Review course collection and prune out courses no longer offered.	Department	D	D	T

Comments 2020:

Discussion and implementation delayed due primarily to staffing issues. We are in the process of hiring three new faculty and will need to replace two additional faculty in the next year. Without knowing who we will recruit as new professors it is impossible to know which courses would stay or go. We need to wait until we have managed to bring in new professors and match them with appropriate courses before potentially wasting our time making changes only to reverse them later.

Comments 2021:

This has been delayed due to the time constraints imposed by our COVID responses. However, we are also experiencing a high level of faculty turnover that is not yet complete. I believe that it will be better to go through this exercise once our five replacement faculty members have arrived.

Comments 2022:

This is the main topic of our departmental retreat this May and we hope to revamp our course collections at that time.

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

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

Actions	Responsibility	Year One*	Year Two	Year Three
Action #1 Have a departmental retreat to discuss issues.	Department	D	D	T

Comments 2020:

The retreat we had planned to have this summer was cancelled as there was no interest in an online format and the group is too large to meet physically. In addition, it was thought that we should wait until after newly hired faculty members are present on campus so that they can be an active part of this discussion on how we move forward as a department. Therefore, this has been delayed until year 2 when we will be in a better position to have this discussion.

Comments 2021:

Delayed due to COVID. Will plan this for spring of 2022.

Comments 2022:

The departmental retreat has been scheduled for this May and will be an excellent opportunity for our department to get back together and more coordinated following a very difficult two years of pandemic restrictions.