

Biology Program Review

Faculty of Science

Dean's Summary

Submitted by:

Dr. Lucy Lee, Dean of the Faculty of Science

Accepted by:

Senate in January 2020

Academic Planning and Priorities Committee in November 2019

Department of Biology Program Review Implementation Recommendations in Response to Reviewers' Suggestions and Unit Responses

Prepared by Lucy Lee, Dean, Faculty of Science

04/11/19

Executive Summary

The Department of Biology at the University of the Fraser Valley underwent a Program Review in 2018-19. Overall, the review was positive as noted in the external reviewers' report, who carried out a thorough appraisal of the Biology Program during the on-site visit May 22-23, 2019. They also provided 8 key recommendations (seven main recommendations with one provided in two parts), that the department has responded, and an action plan was created (attached). The Department of Biology aims to maintain excellent student-centred instruction as noted in their stated mission "*to provide students with a unique appreciation and understanding of the living world. We incorporate a student-centered focus to our courses and deliver a practical hands-on approach to learning. Small class discussions, student presentations, and analysis of scientific research are integral to our courses and provide essential skills for our students*". They strive to provide students with a thorough exposure of key areas in biology, from classical organismal to ecological perspectives, as well as to more modern, cellular and molecular approaches.

The Biology Department is a unit of the Faculty of Science, staffed by 13.7 permanent faculty (10.7 FTE teaching instructors and 3 FTE laboratory instructors), 1 FTE departmental assistant, as well as 4.3 FTE technicians, and a variable number of LTAs and part-time instructors.

The UFV Biology department, offers the following programs:

- Major in Biology (under the BSc)
- Honours in Biology (under the BSc)
- Minor in Biology (under the BSc)
- Minor in Biology (under the BKin)
- Extended minor in Biology (under the BA)

They provide instruction to over 2000 students enrolled in Biology courses (all data is from Institutional research, August 2019), with an average of about 300 Biology majors and minors combined. Over 270 FTE students are enrolled in Biology and the department produces the largest number of graduates by Major for any of the Arts & Sciences programs at UFV (UFV 2018-19 Factbook <https://www.ufv.ca/media/assets/institutional-research/fact-books/UFV-Factbook-2018-19.pdf>). Domestic enrolments in all courses offered by Biology comprised over 90% of students, and International students, albeit growing, still comprises less than 10%. Number of sections offered has been around 100 since 2014 (excluding a growing number of directed studies sections), with most enrolments being at the 100 level courses (>90%). Contact hours for these courses average 40 to 45 hours each per semester, and laboratory sections average 30 to 35 hours.

The Biology Department has produced graduates with solid credentials, and many have found work immediately following graduation or have gone on for further training. Many have gone into professional programs such as Medicine, Dentistry, Pharmacy, Veterinary Medicine, Teacher's Education, etc.

The External Review Panel reviewed the Department of Biology Program Review documentation and interviewed faculty, staff and students during a site visit on May 22- 23, 2019. Their report was made available in late June and subsequently released to the department for their response. Overall, the reviewers praised the Biology Department noting: "Overall, the Biology Department appears to be a cohesive, productive, and dedicated group of Faculty and Staff, which offers a well-respected and robust undergraduate degree in Biological Sciences. The enrolments are consistently strong and the students and alumni have very positive accolades for the faculty and their educational experiences. The class sizes are small and Faculty provide many hands-on learning and research opportunities which students and graduates consistently say they value very highly. Graduates of the Biology program at UFV have gone on to a variety of post-graduate programs; we note an impressive number of students have been accepted to Medical and Veterinary schools as well as graduate degree programs. Research and service activities bring the Biology Department into focus in the Fraser Valley community in many ways and good efforts are being made to make indigenous knowledge and internationalization integral parts of the Biology curriculum and the student experience." The panel provided seven recommendations for which the unit prepared their responses and implementation plans and submitted these to the Dean on September 23, 2019.

Action Plan on Recommendations and Implementation Schedule

The greatest strengths of the Department of Biology are its dedicated and committed faculty members, consistent high quality of instruction (as reported by students), small class sizes, laboratory and field trip experiences, and opportunities for meaningful engagement in research and work placements. Challenges identified by the department and concurred by the review panel were: 1) inadequate number of faculty and staff to support the growing program 2) the need of more space (offices, teaching and research labs) for faculty and students, 3) the need to replace aging equipment and purchase new ones; 4) update/optimize course offerings/scheduling and promote Ecology courses; and 5) a need to expand scholarly/research capability within the university and beyond.

Most of these have been or are being addressed, especially with the expected hire of a new faculty member for the budget year 2020-2021 (pending budgetary approval), and the ability to increase a technician position from 0.83 FTE to full time, to address the concerns regarding inadequate numbers of faculty and staff support. However, the infrastructure needs, especially for physical space are pressing. This is a problem that is echoed through-out the Faculty of Science and the University at-large, and this is an issue that needs a major infrastructure fundraising campaign at the institutional level.

Attached is the response and action plans for implementing the recommendations of the External Review Panel with the tentative schedules for implementation.

All in all, I commend the Department of Biology for their dedication to teaching excellence, for their high student retention, their commitment to Indigenization and Internationalization, and for their continued efforts to make Biology an enduring and highly sought after program.

BIOLOGY Program Review Scope & Action Plan Report

Submitted by:

Lucy Lee, PhD
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Date: Nov. 04, 2019

The following are the recommendations of the review panel (in bold) and their suggestions (*in italics*). Below these are the action plans developed by the department in consultation with the Dean (in green).

1. **Faculty and Staff.**

*“For consistency and quality programming, there is a demonstrated need for more full-time tenure-track faculty. While we realize finances are tight, if the Department is to maintain its high quality of teaching in small classes, and respond to increasing demands for Faculty to engage in research, **at least one more full time Faculty position would be a recommendation.***

Alternatively, or in addition, if it is possible to offer LTAs three- to five-year contracts instead of hiring year by year, that may impart a greater sense of stability to the Department. The Biology program at UBC has developed a novel mentoring system that also adds stability to LTA contracts. It would be worthwhile consulting them on their rationale and procedures.

Returning the 83% lab technician position to full time would also help alleviate the pressure on the rest of the technicians, allowing for more flexibility in scheduling vacations and covering sick leave as well as alleviating pressure at the busiest times of year.”

Action plan: A full time tenure-track position will be recommended for the 2020-2021 budget year. The department has been given the green light to request and advertise for the new faculty position. Additionally, the staff position will be restored to full time as recommended.

Schedule for implementation: Advertise full-time faculty position by winter term 2020, pending final budget approval. Top-up staff position to full-time for next fiscal year.

2. **Lab/Research Space.**

"We realize there are budgetary restrictions and that there may be other renovation priorities at the University, but we would strongly recommend renovation of the remaining teaching and research spaces utilized by the Biology Department within the next five years or so. Meanwhile, we would suggest optimizing the use of the teaching lab in Chilliwack; perhaps a suite of first year Biology and Chemistry labs or second year and/or upper level Biology labs could be offered in Chilliwack such that Abbotsford students could spend a "lab" day there. This might relieve some of the pressure on the un-renovated Abbotsford lab and research space. We realize careful co-ordination between Biology and Nursing, who also use the Chilliwack lab, would have to happen as well as careful co-ordination with the Chemistry Department. Providing supplemental funding to the innovative student-run bus system would help to facilitate this while keeping expenses to a minimum."

Action plan: Deficiencies that affect health and safety of students and staff will be addressed as they arise. Upgrades and renovations are being considered for the next phase of renovations occurring this coming year in conjunction with the exterior building envelope upgrade of Building A East. However, continuing space needs will need to be addressed institutionally as there is the need for a Science/ Research building.

Schedule for implementation: ongoing, but expect to have lab upgrades completed by Fall of 2020.

3. **Office space.**

"We recommend that every effort be made to provide LTAs with their own offices and computers, or at the very least a shared LTA office with University-provided laptops each so that confidential student information does not need to be stored on their own or shared computers. We also recommend that the Faculty of Science implement a one-semester exam storage policy and attempt to provide a central space for storage exams, with a regular schedule of confidential shredding administered by the department."

Action plan: We have procured additional offices in the T building but this is a temporary measure and a more permanent solution needs to be found. We are also considering placing lockers in strategic places to accommodate storage needs and have been in discussion with Facilities who are looking to find spaces in the temporary containers outside buildings C and D.

Schedule for implementation: ongoing. Immediate needs have been addressed but a more permanent solution needs to be found.

4. Equipment.

“That the university commit to a stable and predictable budget for equipment acquisition, replacement and emergency repair. This fund may be supported in part by user fees for grant-supported researchers, assuming that they have budgeted for such in their grants. Going forward, some level of research overhead and/or requirement for researchers to include equipment use fees in grant proposals would help in this area. Implementing student lab fees as part of their tuition may be an additional option that could be considered; lab fees are charged at other institutions to help defray costs.”

Action plan: As the Faculty of Science expected a surplus in this budget year, equipment replacement is a priority that is being addressed along with Chemistry and Geography laboratory needs. Faculty are encouraged to apply for external grants and include overhead costing for equipment needs. This has been under continual discussion with the Office of Research.

Schedule for implementation: Winter 2020 to Fall 2020.

5. Course Offerings and TimeTabling.

a) Upper level offerings:

“Careful scheduling of courses is a must so that options for students do not overlap and enrollments can be optimized. Perhaps fewer courses could be offered in areas of particular Faculty expertise and a stable two-year rotation for upper-level courses could be established, with the more popular elective courses being offered every year as well as the core courses. We would also recommend that some mechanism be put into place, either through advising or through talking to students in second-year classes, to gauge interest in upper-level electives and special topics courses so as to schedule them appropriately. As well, giving priority to upper-level students or adjusting pre-requisites in upper-level electives might allow upper-level students to take the electives they want. The Department is encouraged to continue to excel in instruction and offering hands-on laboratories for students.”

Action plan: With the addition of a new full time position in Biology, it should be possible to better plan for regular course offerings. Additionally, updating and reducing old courses at the upper level is in process.

Schedule for implementation: ongoing, expected completion within a year frame.

b) Ecology offerings:

"We would like to suggest that if another organismal/ecology type course was offered as an option in 2nd year, either as a requirement or as a choice (as is done for upper level core courses), more students might pursue Ecology/Organismal biology as a concentration and it might take some of the pressure off enrollment in the other core courses at second year. One thought we had was that a course such as Plants and Animals of BC (BIO 330) could be moved to 2nd year, or a similar introductory course about local flora and fauna be developed; this would have the added benefit of introducing "Indigenous biology" early in the curriculum and make better use of Faculty with ecology backgrounds. Or BIO 219 Biogeography could be added as an option to the suite of core of second year courses. Perhaps BIO 202 (Cell signaling/gene regulation) could be moved to the upper level, as a core option or as an elective (as it is at many other universities in BC). We would also encourage the Dean to allow especially ecology courses to run with less than full classes for a time to establish a rotation that enables students in the ecology stream to graduate in a reasonable amount of time. The summer term may be an opportunity to offer students more courses in ecology and if advertised enough in advance, they may get better enrolments.

We also recommend moving the evolution course earlier into the course sequence (perhaps third year) and making it a required part of the degree. An evolutionary understanding is vital for biology, and also could serve to get some students excited about inquiry at the ecological scale.

In addition, we recommend either updating existing molecular courses to include more ecological content, or creating a new molecular ecology course..."

Action plan: The departmental curriculum committee will be tasked to review the ecology/plant type course offerings and offer alternatives to the bottleneck currently seen in the cellular/molecular type courses.

Schedule for implementation: immediate and ongoing. The curriculum committee's recommendations are expected to be implemented in the next academic year (2020/21).

6. Advising.

“Better coordination between Advising and the Department Head regarding scheduling will allow for students to plan their degree completion pathways with more efficiency. Efforts should be made to better gauge student demand for various courses, especially ecology and Special Topics courses and to ensure that the offering of these courses has been decided and announced well in advance of registration.”

Action plan: The department will work with Advising to clarify the three-year plan for course offerings and will ensure the department website clearly indicates all the main courses that will be offered. The department will also try to add extra sections of high demand courses (e.g. BIO 309 Microbiology) based on previous year wait lists. Furthermore, the department will limit the offering of special topic courses to ensure the main courses listed in the calendar are offered annually or every two years in the fall or winter semesters. The department will also evaluate whether courses should be discontinued if they are low demand or no longer offered. To inform students of course offerings well in advance, faculty will be encouraged to consult with the Science Communications specialist to update relevant web-pages and other communication venues. This will be facilitated by the Department Assistant as well as the Faculty of Science Administrative Assistant and the Science Communicator.

Schedule for implementation: over the current academic year and ongoing, with curriculum review components to be implemented starting in 2020/21.

7. Research.

"We would encourage the Research Office to be creative in finding sources of small to medium-sized grants for Faculty to continue research projects that involve students and the community rather than just the larger Tri-Council grants. Smaller research institutions have the advantage of being more closely plugged into the research needs of the local community, and, as evidenced by the research activities of the Biology Faculty, UFV is not an exception to this rule. While landing Tri-Council grants is the large prize, obtaining a variety of smaller (and some larger) locally-targeted grants could help to set the foundation for Tri-Council grants. In addition, some larger funding agencies have regular calls that often apply to local research activities. These include GenomeBC and MITACS. Successful grant applications, and then the research work and publishing made possible by using funds from such organizations, may help Faculty to ultimately land more NSERC Discovery (etc.) grants. In addition, we would like to draw the Department's attention to NSERC's new Alliance grants, all of which require partnerships, but some of which do not require matching funds, and none of which require applicants to hold Discovery grants. We recognize that the transition from being a College to a University, where research is an expectation, is not an easy one. Many or most of the Faculty at UFV were in place during the transition, and not all of them may want to create large research programs at this point in their careers. While we feel that all Faculty at a university should be involved in research at some level, it is likely that some Biology Faculty will be more interested than others in the work required to develop a research program. Those Faculty members should be able to identify themselves and should have access to funds and programs that will allow them to excel in that area. Future hires should be made with research in mind. Workloads for both teaching and research then need to be considered and balanced depending on Faculty output in both areas. The Department should also make use of the Canada Research Chairs program to bring in new faculty or to retain existing faculty who would like to spend more of their time pursuing research, as the CRC program can be leveraged within an institution to improve the research output of other faculty members beyond the Chair."

Action plan: The Dean's office has been providing discretionary amounts of funding to facilitate research and support student researchers. This is obviously not enough, and faculty will be encouraged to become more active in seeking external research funds as well as in seeking internal sources of funding. Along with the Office of Research, the faculty has been made aware of various funding opportunities including the Alliance grants and it is expected that some faculty may apply within the foreseeable future.

Schedule for implementation: ongoing.