Two-Year Progress Report of the Department of Biology

Introduction

The self-study of the review of the Department of Biology was completed November 2009, and the site visit was conducted 2 to 4 June, 2010. The review team submitted its report on 5 July, 2010 and the Department’s response was received 7 October, 2010. The academic program review report was approved by Senate Undergraduate Council on 9 November, 2010 and was presented to Senate on 17 January, 2011. This report was received 17 January, 2013 and describes progress made in the undergraduate plans in the past two years.

Undergraduate Enrollment

The admission rates for entry into the various Biology plans have remained slightly above target admission set by the Faculty of Science. The Department is currently at capacity for laboratory space for larger undergraduate laboratory courses e.g. BIO 130L (Introductory Cell Biology Laboratory). The Faculty of Science provided funds to purchase an additional laboratory section worth of equipment to allow the Department to launch a third concurrent section of BIO 130L for the first time in fall term, 2012. The additional space located in the new Science Teaching building, which is currently under construction, will alleviate some of the undergraduate laboratory space constraints.

Response to Recommendations (in order of importance)

Recommendation: that the University of Waterloo (UW) commit to reducing the student to faculty ratio in Biology (~40:1) to meet national or at least provincial standards in Biological Sciences Departments.

The Department has been notionally granted both faculty members (two Lecturers, three Assistant Professors and two Associate Professors) and technical support positions (replaced two retired technicians and another technical position is awaiting approval) to begin to address this issue. Unfortunately these new arrivals have just kept up with recent and upcoming retirements.

Recommendation: that the Department revises its course offerings for lecture courses that were decoupled from the laboratory component.

The Department is investigating the feasibility to decouple lecture and lab courses. Some courses may have to be offered in a partly uncoupled form, because they serve as prerequisites for other programs that do not require the laboratory component. Efforts to decouple laboratories will continue where possible.
Recommendation: that the Department revisits its proposal for five new FIELD titles for the graduate program and develop a logical relationship between the undergraduate program of specializations.

The approved graduate fields for the Department are; Ecology and Environmental Biology; Bioinformatics; Systematics and Evolution; Physiology, Cell and Developmental Biology; Molecular Genetics; and Microbiology. The undergraduate specializations, while partially aligned with the graduate fields, are designed with a much different emphasis: to cover the essentials of basic life science training rather than research technologies. There is the further complication of the programs associated with Biology but outside the Honours Biology core, such as Honours Biomedical Sciences, two joint programs (Honours Biochemistry and Honours Bioinformatics) and Honours Environmental Science (Ecology Specialization), Thus a direct alignment between undergraduate specializations/programs and graduate fields is not practical.

However, considerable progress has been made in aligning the undergraduate programs with each other. The undergraduate curriculum committee reviewed the first two years of the Honours Biology program and has had departmental approval of a revised curriculum for Honours Biology and Honours Biomedical Sciences with effective dates of September, 2012 and September, 2015 respectively. The change to the Honours Biology curriculum has introduced seven Biology specializations (Non-Specialized; Animal Biology; Biotechnology; Environmental Biology; Microbiology; Molecular Genetics; and Plant Biology). The revised curriculum will align the first two years of the Honours Biology and Honours Biomedical Sciences programs. This alignment will allow for a student to change programs within the first two years without major impact on their progression through the program. The Department will monitor the change to the Honours Biology curriculum with respect to distribution among specializations.

Recommendation: that the Dean’s Office explicitly communicate with faculty members, staff members and students specific space plans within realistic timeframes relating to the construction of a new building and the space allocations for Biology in that building.

Key individuals of the Department have been identified to work closely with the Dean’s Office with regards to the new Science Teaching building. Six undergraduate laboratories, along with two laboratory prep rooms, equipment rooms and storage rooms have been allocated to serve Biology undergraduate laboratory courses. Three of the laboratories have been identified for first- and second-year Cell Biology/Physiology courses with the remaining three laboratories slated to run Microbiology courses.
Upon completion of the new Science Teaching building the Department will be in the position to launch laboratory sessions in current Biology undergraduate courses that do not have a laboratory component (e.g. Molecular Biology and Ecology). These laboratory courses will ensure that undergraduate students receive an experiential learning component that cannot be offered in lecture-only courses currently being offered. Additional resources will be required (e.g. laboratory instructor, technicians and teaching assistants) in order to meet the demands of the added laboratory sessions. Whether the new teaching building will have a significant effect on space available to hire research faculty members will depend on increasing enrolments and new or re-coupled laboratory courses. These factors will determine whether current undergraduate laboratory space in the existing building can be renovated into research space.

The Department has already begun plans for new research space by construction of a greenhouse/ecology teaching and research station/aquatic laboratory on the north campus. This would clear footprint for a new research building on the current greenhouse location, as well as allow re-purposing of prime space in the main Biology building.

**Recommendation: that the Department becomes more implicated in the administration and design of the Bioinformatics program.**

The Department has had a recent hire in Bioinformatics at the junior faculty level. At this point the Department will have a critical mass around which to focus a Biology-centred Bioinformatics/Computational Biology program.