

Final Assessment Report

Academic Review

Biology & Chemistry

A. Summary

- i. The Self Study was approved by the Provost.
- ii. The Review Committee consisted of two external reviewers: Dr. Linda Corkum, University of Windsor and Dr. Athar Ata, University of Winnipeg and two internal reviewers, Dr. Dan Walters and Dr. Sean O'Hagan.
- iii. The site visit occurred on March 14 and 15, 2013.
- iv. The Reviewers' Report was received on April 12, 2013.
- v. The Department's response was provided on October 21, 2013.
- vi. The Faculty Dean's response was received on October 18, 2013.

The academic programs offered by the Department which were examined as part of the review included:

BSc Honours Specialization in Biology
BSc Specialization in Biology
BSc Major in Biology
BSc Minor in Biology
Certificate in Neuroscience
BSc Minor in Chemistry

This review was conducted under the terms and conditions of the IQAP approved by the Nipissing University Senate on May 17, 2013, and ratified by the Quality Council on June 28, 2013.

B. Strengths

The Review Team noted the following in relation to the strengths of the Department: *The "Biology/Chemistry Department of Nipissing University (NU) has a dedicated faculty and staff, who provide an excellent training for undergraduate students. Students appreciate the small classes, the opportunity to interact closely with instructors, and the large number of laboratory and field experiences associated with many of the courses. The natural setting around the university provides an ideal opportunity for teaching ecology. The nearby ALCAN field station is a particular asset, but appears to be underused.*

Facilities are new. Both teaching and research equipment are exceptional. Many students, who graduate, go on to graduate school. The Environmental Biology and Technology program in which students spend their second year of study at Canadore College (the College and the

University share the same building) is an excellent program and serves as a model for other universities.”

C. Opportunities for Improvement and Enhancement

The Review Team offered the following specific recommendations:

1. A departmental committee should be struck to continually review the curriculum so that students receive a balanced offering of courses each year.

A long-term plan of course offerings is needed. This is an urgent need and one that students at other universities in Canada expect and receive. It is essential for students to have information about the curriculum so that they can effectively plan their 4-year undergraduate program. The schedule can simply be in the form of a table, indicating the departmental course offerings for the next four or five years. This table should be made available as a handout to students in their first year of study as well as being available on the departmental website.

In its response, the Department stated that the “we agree that the curriculum is in need of a holistic review that takes account of the core requirements for a Biology degree, and also takes advantage of the special areas of advanced knowledge, experience and techniques of the individual Tenured and Tenure-Track faculty. This academic year the Department will begin a full curriculum review. We will start by examining the content of our first year courses and reviewing how the first year Biology courses (BIOL 1006 and 1007) and first year Chemistry (CHEM 1006 and 1007) link to upper year courses ensuring the first year courses are serving their intended purpose. The Department will then identify major gaps in our curriculum not only in terms of courses, but identifying the fundamental principles that our students should be getting by the time they graduate from our program. In some cases new courses may be required; in other cases we may be able to add missing content to existing courses or merge existing courses. Identification of core courses, both existing and needed, as well as elective courses at the third and fourth year level will allow us to offer a flexible and balanced program. We also need to identify core principles that are missing from our program and address any areas of content overlap.

One major gap in our program is the lack of a course in Evolution which is the foundation of Biology and a core course at other Universities. The Department is currently developing a course in Evolution to be offered in the 2014-2015 school year. Additionally, to address the lack of Molecular Biology and Physiology courses in our program, the Department is engaged in talks with the Biotechnology Program at Canadore College. We are looking to devise a shared program similar to the Environmental Biology and Technology (ENBT) program we currently have. In the ENBT program students take years 1, 3 and 4 at Nipissing University and year 2 at

Canadore College. Once completed students receive their 4 yr degree from Nipissing and a diploma from Canadore. In a shared Biomed program potentially students would take years 1, 2 and 4 at Nipissing and year 3 at Canadore where they would have the opportunity to take several Biomed courses which we cannot offer. Working with Canadore College on a shared program also fits the current vision of the MTCU of increased collaboration between Universities and Colleges.

A thorough re-examination of our program will also allow us to address other issues brought forward such as students reporting too many 3h lectures instead of 2 x 1.5h. In certain cases e.g., upper year courses, where discussion is an important component of the course, a single 3h lecture will be optimal; however we do acknowledge that for most lecture-based courses the 2 x 1.5h format is better for student learning. We will also examine the issue of course overlap to determine whether true overlaps exist and redundancy can be removed or if what students perceive as overlap is in fact reinforcement of a core/fundamental principle. The development of a 4- year "Planning Horizon" table to help students plan their program will be examined and the feasibility of constructing a reliable table will be assessed, with the caveat that we would need to retain the flexibility to make adjustments on a year-to-year basis depending on personnel, resources and enrollment. Once this process is complete it will also facilitate production of the course master in partnership with the Dean's office.

However, the issue of balancing courses may not be logistically possible because we have to also balance the teaching loads of existing Tenured and Tenure-track faculty. Existing faculty may not be able to fill all of the gaps in our program, and we cannot add new elective courses if they simply spread the same number of students across a larger number of (under-enrolled) courses. In any event, despite the issues raised by the reviewers and our students, the enrollment numbers in Biology and Chemistry are increasing despite the gaps in our program; we believe a strong case can be made for additional faculty in the Chemistry and Molecular Biology areas, and for the equipment and supplies necessary to give our students high quality laboratory experiences that match those in the ecological areas."

The Faculty Dean noted that "the reviewers' concerns are many with respect to curriculum: there are too many ecology courses with overlapping content and an insufficient number of molecular biology, physiology and chemistry courses; a high percentage of courses taught by sessional instructors; and scheduling issues coupled with a lack of a long-term plan that would allow students to plan their degrees.

The sessional instructors in Chemistry/Biology are exceptional teachers, so the department is comfortable with the amount of teaching they have assumed over time. There seems to be no reason to reallocate sessional instructors or to reduce their teaching roles at this time; the reviewers' comments address workload not quality of teaching.

Of the set of concerns presented, the priority is to redress the imbalance between ecology, molecular and physiological biology. A four-year plan may help the chair better organize resources, secure commitments from faculty for future teaching assignments (allow course prep, etc.), but there is some urgency to a committee of the whole refining the course offerings, stripping out redundancy (where there is no pedagogical value), and restoring molecular/cell

and physiological biology course to the roster of routine. It should be noted, the ecology and environmental science is a promoted area of expertise and recruitment for students. This context potentially explains how the imbalance occurred.

Given the teaching and research expertise of current faculty, with a rearrangement of assignments, with an explicit focus on greater balance between ecology, molecular/cell and physiological biology, we may be able to accomplish the desired end without a new hire. That determination can only be made once the curricular work at the department level is complete.”

PPC response is as follows: (1) the Department needs to adopt a multi-year course planning strategy, although at this point a two or three year planning scenario is all that PPC would require. This would allow students to know in advance which upper-year courses are scheduled to be offered over the next two or three years. (2) Moreover, PPC requests that the Department provide more balance within its course offerings by reducing the number of Ecology courses offered. If that is not possible in the short-term due to existing staffing, new hires need to take that into account.

2A. The Biology/Chemistry department should be encouraged to hire a faculty member in Chemistry

The Department responded that “we agree that a new hire in Chemistry is needed. The University needs to expand its Chemistry offerings to provide a more robust science experience. We have in the past lost students to other Universities when they sought more in-depth chemistry coursework. Expansion in Chemistry could also offer support for the Master’s in Environmental Science and potential future programs such as Chemical Engineering. The Department currently offers a Minor in Chemistry and would like to expand that to a Major, and later the Honours Specialization. To facilitate a balanced Chemistry offering we require additional core courses. Currently we are missing Physical Chemistry although we have significant offerings in the applied area of Analytical and Environmental Chemistry, and we need a hire in this area to bolster teaching and research. Hiring a Physical or Biophysical Chemist would enhance the range of research experiences available for students, it would allow us to offer the 12-course major in Chemistry, and it would elevate the program diversity and research profile of the University.”

The Faculty Dean advised “that a physical chemist would be a good complement to current resources (to both teaching and research) in Biology and in Geography; however, the student numbers do not support a hire at this time. The argument is presented that in the absence of a major in chemistry, students are not taking the minor. It is hard to determine real/pent up interest if this is true. Moreover, a new hire would represent a profound challenge to lab capacity.

As a future hire, a physical chemist makes good sense, esp. once we have been able to reconfigure the labs to house the possibility. The priority should be to equip a second chemistry lab with another lab instructor.”

PPC response is as follows: **PPC notes according to Quality Assurance Framework Reviewers are asked to comment on the “Appropriateness and effectiveness of the academic unit’s use of existing human, physical and financial resources in delivering its program(s)”. In making this assessment, reviewers must recognize the institution’s autonomy to determine priorities for funding, space, and faculty allocation.” Accordingly, PPC refers this matter to the Dean for consideration as part of the normal budgetary process.**

2B. The university should create a second equipped chemistry laboratory.

The Department responded that they “*agree that the Department urgently requires a second Chemistry teaching lab to accommodate more students in upper year chemistry courses. With only one chemistry teaching lab we are severely constrained. Students taking chemistry are mainly majoring in Biology and there are often conflicts between Chemistry and Biology courses. This requires that the Registrar recognize that Biology and Chemistry are usually taken together (it is, after all, a joint Department) and therefore course conflicts should not be allowed in the scheduling program. If we had a second chemistry teaching lab we could potentially draw more students into Chemistry.*”

The Faculty Dean’s response was included in the above response to recommendation (2A).

PPC response is as follows: **PPC notes according to Quality Assurance Framework Reviewers are asked to comment on the “Appropriateness and effectiveness of the academic unit’s use of existing human, physical and financial resources in delivering its program(s)”. In making this assessment, reviewers must recognize the institution’s autonomy to determine priorities for funding, space, and faculty allocation.” Accordingly, PPC refers this matter to the Dean for consideration as part of the normal budgetary process.**

3. The department should be both supported and encouraged to increase its research culture.

The Department responded that “*the reviewers point out that the research culture currently in the Department needs improvement. Some members of the Department show strong productivity, while others do not. Increased support from the Research Office particularly in terms of identifying alternate funding sources would help us to increase productivity within the Department. This is particularly important since Tri-Council funding has become more difficult to obtain for faculty in small Universities (although the many undergraduate honours thesis students we support are regarded as HQP as well as the Master’s students in the new MESC program). Additional support in grant writing would also be helpful. Many Universities have dedicated grant writers in their Office of Research Services who help researchers to formulate their grant proposals. This is something that is very much needed at Nipissing University. We are beginning to implement an in-house peer-review process where senior faculty who have held and reviewed NSERC grants in the past volunteer to provide editorial suggestions to*

colleagues. The Department needs a dedicated staff member to support major research facilities such as the Plant Growth Facility. There is currently no technical support for our greenhouses. The provision of such support would significantly increase research potential and productivity.”

The Faculty Dean advised that “it is concerning that no one in Biology currently holds NSERC funding. Chemistry faculty do have funding. While it may be increasingly difficult to access tri-council funding given the nature/realities of the fund, especially for faculty without track records of success at securing funds, the University has someone dedicated to developing links with government and industry [name deleted] who can certainly help faculty tap into other sources of funding. Members of the department should ask for assistance from either the office of the Dean, or Research Services, to foster their research agenda.

Recent hires have been provided with more opportunities to do research by virtue of the structuring of their contracts and SURG grants, and they have been successful. Having said this, we may have corrected the situation for new hires; we need to redress some of the systemic issues for longer-standing hires.

Once I have read and responded all the Faculty Annual Reviews, I will meet with all faculty without funding or research plans to discuss strategies for developing proposals and partnerships”.

PPC response is as follow: **PPC notes that faculty in Biology and Chemistry have access to the same institutional resources as faculty from other Departments.**

4. The high calibre research equipment needs to be maintained and upgraded.

The Department responded “that it has been successful in obtaining Canada Foundation for Innovation (CFI) grants in the past to purchase high calibre analytical equipment. Most of our CFI equipment has now gone past the initial 5 yr maintenance period and those funds are no longer available. The Department would urge the University to assist in providing funds to maintain equipment and facilities, particularly those that are intensively used in undergraduate courses, and student and faculty research. Equipment that is not maintained and becomes non-functional seriously undermines research productivity. New equipment is also needed and would increase our analytical capability, especially if we seek the OA/QC provincial accreditation that is required in order to provide fee-for service analyses for outside companies, government agencies and other organizations.”

The Faculty Dean advised that “the Assistant Vice-President, Research is working on a strategy to maintain and upgrade equipment purchased through CFI grants. This is an issue of concern for a number of departments.”

PPC response is as follows: **the University will continue to use its CFI allocation strategically, but the amount available is a function of Tri-Council funding and therefore limited.**

5. The university should provide space and resources for a staffed Biology office.

In the last 2004 departmental review, there was a recommendation for the University to provide a Biology Department Office. This recommendation has not been addressed.

There is still no Biology office. Students require a discipline specific office staffed with a knowledgeable person to obtain counselling advice (or make counselling appointments with faculty), as well as to receive information about specific course offerings, scholarship applications and postgraduate opportunities. Students are disappointed with the present counselling advice offered by the Registrar's office.

The Department responded that it *“agrees that such an office would be an important resource for students and faculty. The same recommendation was made in the 2004 Departmental Review and 8 yrs later still has not been addressed. A Department office is instrumental to assist students with counselling and program information, scholarship information, postgraduate and employment opportunities. Currently most students are uninformed about how to seek career advice, especially in relation to graduate and professional school. The academic advisors in the Registrar's office are limited in scope to general information about undergraduate program requirements. Furthermore, the department does not have a central location in which to store departmental records; earlier records have been retained, or discarded by past chairs in a haphazard manner. A Department office would provide continuity and make the department run more efficiently. It would also help us to provide more effective advising and guidance for our students, supporting more effective student progress, retention, graduation, and career placement, which, in the long term would provide better use of resources and enhance the reputation of the University.”*

The Faculty Dean advised that they *“believe plans are underway to allocate to departments shared secretarial support.”*

PPC response is as follows: **the primary object of this recommendation is outside the scope of the IQAP program review. However, it should be noted that the University agrees that offices for faculty within the same academic unit should be grouped together to create what could be described as “departmental space”. The issue of how to provide logistical support is under review. As to the issue of academic advice, PPC considers that part of that responsibility belongs to the Chair of the Department and faculty in general, in addition to the advice that can be provided by a more generic academic advising office.**

6. The Biology department head should have more authority.

The Department responded that *“the business of the Department is coordinated by a chair and not directed by a head. Relative to other Universities, Department Chairs at Nipissing University do not have the same level of authority in regards to managing Departments. Decisions are made in a collegial fashion by the Department. In contrast to other universities, Nipissing chairs remain members of the Faculty union during their tenure, which prevents them from being regarded as “supervisors”. However, this is a matter for collective bargaining and will not be discussed further here.”*

The Faculty Dean advised that *“the role of Nipissing University Chairs is a matter of the Collective Agreement.”*

PPC response is the following: **the issue of the authority of the Chair of the Department is covered in the Collective Agreement with NUFA, and no further action is warranted as a result of this Review.**

7. There should be student representation on departmental, faculty and university committees.

The Department responded that *“they agree with the Reviewers’ recommendation that student representatives should be included on committees and attend department meetings. We have already spoken with the President of the Biology Students’ Society and have extended an invitation to their executive members to participate in departmental committees and meetings.”*

The Faculty Dean advised that *“the Collective Agreement does not restrict membership of departmental committees to faculty. Student representatives should be elected to the primary committee of the department, and appointed to hiring committees and any subcommittees of the whole where appropriate. Student representatives are prescribed on many university committees by Senate by-law.”*

PPC response is as follows: **PPC encourages the Department of Biology and Chemistry to include student representation in Departmental committees and meetings.**

8. Insure that scholarship students in the Environment Biology and Technology program retain their awards.

The Department responded that *“they agree that students should not lose their University status when going over to Canadore College in the ENBT program. We have raised this concern with the Dean and Registrar and don’t believe this will be a difficult issue to resolve.”*

The Faculty Dean responded as such: *“In brief, it seems unclear who would redress/repair the implications of this policy decision that was made some time ago. My understanding is that students are completing the EBT program in year 2 or 3 and returning to Nipissing University for 1 or 2 years. It would make sense that they should be able to pick up their scholarships upon their return.”*

PPC response is as follows: **PPC notes that according to Quality Assurance Framework, Reviewers are asked to comment on the “Appropriateness and effectiveness of the academic unit’s use of existing human, physical and financial resources in delivering its program(s)”. In making this assessment, reviewers must recognize the institution’s autonomy to determine priorities for funding, space, and faculty allocation.”** Notwithstanding, PPC recommends that Financial Aid review its policy concerning scholarships for students in the Environment Biology and Technology program.

9. Encourage and support thesis students to participate in Ontario Biology Days, an undergraduate conference for thesis students.

The Department advised that *“our Department used to attend Ontario Biology Days (OBD) regularly in the past, but we have not attended for more than 5 yrs. Once Nipissing started its own Undergraduate Research Conference the dates often conflicted. Notices regarding OBD are circulated to faculty, but there has been little interest in follow-up from students.”*

The Faculty Dean suggested that *“the timing of Ontario Biology Days has conflicted with the University’s Undergraduate Research Conference.”*

PPC response is as follows: **PPC agrees that students should be encouraged to participate in Ontario Biology Days, but does not recommend any other action.**

10. Participate in the Ontario Summer Field Course program

The Department *“agrees that participation in the Ontario University Program in Field Biology would enhance the profile of the Department and the University. At our Departmental meeting in March 2012 [name deleted], the coordinator for the Ontario Summer Field Course Program, was invited to provide us with an overview of the program so we are aware of the general format and expectations. All courses must be in the form of a 14 day module. The Department will*

consider converting one of our field camp courses into a 14 day module to allow us to enter the program; however several budgetary and logistical issues will have to be resolved before this can happen. We understand that any student across the province can take a summer field course at any other participating University and that it counts for a course credit on all participating Ontario University transcripts.”

The Faculty Dean advised that *“the department is looking to participate in the Ontario Summer Field Course program. The Lake Talon Field Station would need a considerable upgrade before inviting people from other universities to the site. Regardless of participation in OSFC, the Lake Talon Field Station should be upgraded and more use by faculty should be encouraged—it is under-used.”*

PPC response is as follows: **PPC recommends that the Department investigates how it could participate in the Ontario Summer Field Course program.**

D. Recommendations

Below are the recommendations that require specific action as a result of the Review, along with the identification of the position or unit responsible for the action in question. Notwithstanding the position or unit identified as the being responsible for specific recommendations, the overall responsibility for ensuring that the recommended actions are undertaken is the Dean of the Faculty of Arts and Science.

PPC Recommendations	Responsible	Projected Date
(1) That the Department adopt a multi-year course planning strategy, two or three years.	Department	February 2017
(2) That the Department provide more balance within its course offerings by reducing the number of Ecology courses offered.	Department	May 2017
(3) That the Department of Biology and Chemistry reviews how to include student representation in Departmental committees and meetings.	Department	December 2016
(4) That Financial Aid review its policy concerning scholarships for students in the Environment Biology and Technology program.	Financial Aid	December 2016
(5) That the Department investigates how it could participate in the Ontario Summer Field Course program.	Department	May 2017