

Senate Committee on University Planning

Academic Unit Review Summary: DEPARTMENT OF PHYSICS

Site Visit	March 28-29, 2012
Informal Response to Planning	June 22, 2012
Formal Response to Planning	November 19, 2012
Implementation Update	April, 2014
Midterm Review	2016-2017

Summary of Departmental Self-Study: The Department of Physics has a long history at Mount Allison University. Originally, the focus of the department was “fairly classical.” In recent decades, the curriculum has broadened to include astronomy, optics, and a detailed sequence of quantum-related courses. Ever adaptive, the department has customized courses for non-majors (e.g., biology students) while developing a strong curriculum for majors and honours.

At the time of the self-study, the department was home to 4.5 FTE tenured faculty and 1.0 FTE term faculty, with 2.0 FTE technical staff. Faculty in the department have been the recipients of teaching and research honours. The department has been the home to a Tier 2 Canada Research Chair, and individuals holding endowed chairs (notably, the O.E. Smith Chair in Physics). Members of the department have been recipients of teaching awards such as the Canadian Association of Physicists Medal for Excellence in Undergraduate Teaching and the Tucker Teaching Award, and winners of the Paul Paré Medal and Paul Paré Awards of Excellence. All members of the department have active research programs that have garnered both internal (Crake Foundation, Marjorie Young Bell Faculty Fund) and external (NSERC, CIHR, CFI) grants, as well as international grants and contracts.

A teaching-focused department, physics at Mount Allison University has been a leader in the development of innovative approaches to undergraduate teaching. A cornerstone of the program is an experiential physics approach used in first year courses (PHYS 1051, 1551, 1401, and 1041), which ensures that students are involved in hands-on learning involving faculty and senior student TAs/mentors. Experiential learning is now common in upper-year courses as well, ensuring that students in physics are very well prepared for graduate programs and for employment upon graduation. Presently, approximately 3.5% of student registrations are in physics. The self-study outlines broad goals for the department including a curriculum that ensures an outstanding undergraduate education in the discipline that will position graduates to pursue advanced degrees or employment, along with a commitment to sustainability.

Following the last review of the department (in 1998), a number of changes were instituted, and

the department has been committed to continuous improvement that has been possible through renovation of laboratory and teaching space, the addition of various forms of infrastructure (acquired through CFI and other funding), careful attention to curriculum revision, and a focus on pedagogy. The department is highly collaborative (internally as well as within the University), as is reflected in the innovative research and teaching that is carried out by members of the department.

The department has placed a premium on outreach as well, supporting the Physics Society and the Astronomy Society, participating in Leadership Mount Allison, the NSERC CRYSTAL project (which supports science education in the K-12 system), youth summer camps, and outreach in connection with the Mount Allison Gemini Observatory.

Summary of External Reviewers' Report: The executive summary of the external review offers a succinct picture of a department: it is innovative in its teaching, offers unique programming, and is populated with individuals who are research-active but also deeply committed to providing a high quality undergraduate educational experience. Put simply, “the Physics Department [is] a small but mighty unit that is ‘punching above its weight.’”

Although the external reviewers offer high praise for the department, they identify a number of areas where the department could institute positive changes that would further strengthen its curriculum, stabilize the leadership of the department, and improve the infrastructure and resource base of the department. The recommendations include the following:

Teaching & Curriculum: A general review of curriculum is recommended. A reduction in the number of labs attached to courses is recommended as part of the curriculum review. Greater profile of the Astronomy program is suggested. The department is encouraged to rotate courses such that the timetable can be accommodated in light of the department’s staffing plan. Greater collaboration with the department of Mathematics and Computer Science is advocated.

Staffing: The faculty complement is 5.5 FTE (including one term appointment). The external reviewers recommend that a tenure-track position in Astronomy be authorized. Additional recommendations focus on sabbatical leave planning, ensuring equitable teaching loads, and ensuring that the department has sufficient high quality teaching staff to deliver the academic programs.

Students: The department is encouraged to strengthen its advising system for students, consult with students on the best ways to engage them in the governance of the department, and develop “sustainable ties with alumni.”

Department Leadership & Resources: The practice of one-year rotating headships in the department is strongly discouraged. Additional recommendations focus on securing more (and more adequate) resources for the department (specifically for TAs), renovation and maintenance of space, and appropriate and adequate library resources.

Research & Graduate Studies: The external reviewers recommend that the department not seek

to establish a graduate program at this time.

Summary of Departmental Response: The department is supportive of all of the recommendations in the external reviewers' report. Members of the department have already begun a process to review the departmental curriculum (including labs), and the rotation of courses. Highlighting Astronomy courses is being done in collaboration with the Science Administrative Coordinator. With respect to staffing, the department is eager to secure a tenure-track position in Astronomy, and this will be presented to the Dean for consideration in the 2013-2014 budget. Workload monitoring and sabbatical leave planning are already being done. The department is eager to work with University Advancement to establish an endowment for a post-doctoral fellowship in Physics. The department is looking for ways to work more effectively with and on behalf of students. The department is returning to headships with a longer horizon than one year. It will continue to seek adequate resources and infrastructure to support the teaching and research activities within the department. No plans are in place to establish a graduate program at this time.

Planning Committee and Provost Response: The Planning Committee was pleased with the tenor and substance of the reflections contained in the department's self-study and its response to the external reviewers' report.

The department was judged to be well-managed, and strong in all areas (teaching, research, and service). Aside from Saint Mary's University, Mount Allison is the only physics program in Atlantic Canada to offer a minor in astronomy. If a permanent position is not secured in astronomy, it may be necessary for the department to discontinue its astronomy program.

Consideration of the resource requirements of the program will be considered as part of the budget process in 2013-2014 and in the years ahead.