

**PHYSICS**

**CYCLICAL REVIEW - FINAL ASSESSMENT REPORT & IMPLEMENTATION PLAN**

**PROGRAM QUALITY ASSURANCE COMMITTEE (PQAC)**

**DEGREE PROGRAMS: BSc Physics**

**BSc Chemical Physics**

**REVIEWERS: Dr. Mark Gallagher, Lakehead University**

**Dr. David Hanes, Queen’s University**

**DATE OF REVIEW VISIT: March 4-5, 2013**

**OVERALL ASSESSMENT: Good Quality – BSc Physics**

**Good Quality – BSc Chemical Physics**

**SUBMITTED FOR SENATE APPROVAL: February 2014**

**EXECUTIVE SUMMARY**

During the academic year 2012-2013, the Department of Physics completed a review of the BSc in Physics and a BSc in Chemical Physics. The two degree programs in the department were addressed separately, and assessed as being “of good quality”. The Program Quality Assurance Committee (PQAC) supports the assessment of the External Reviewers after a thorough review of the following documents: Self-Assessment, Reviewers’ Report, Departmental Response, and Decanal Response.

The reviewers conducted a site visit during the winter of 2013, meeting with: senior administrators; faculty and staff members in the Physics department; members from the cognate departments of Chemistry, Computer Science and Mathematics; part time faculty; graduate teaching assistants; and undergraduate students from the Physics and Chemical Physics programs. Based on the Departmental Self-Assessment and their site visit, the reviewers assessed both the Physics and Chemical Physics programs as being ‘of good quality'. After a thorough review of the following documents: Self-Assessment, Reviewers’ Report, Departmental Response, and Decanal Response, the Program Quality Assurance Committee (PQAC) agreed with this assessment.

In support of this assessment, the reviewers commented that the Department fulfilled the objectives, set out in its Mission, to “provide Physics undergraduates with a broad, up-to-date, fundamental, student centred, physics education that will enable them to be competitive for either industrial jobs or graduate studies” and to enable students to “assist with research within the department”, by delivering rigorous programs that incorporate experiential and peer-to-peer approaches to learning. The reviewers found the program requirements to be comprehensive, the teaching methods effective and delivering of quality graduates, and the faculty of high quality.

The reviewers have few recommendations that would lead to an improvement of the programs. They

“note with particular regret the absence of a dedicated final-year laboratory course, which is a central part of most standard physics programs”; such a course apparently existed at Trent but was discontinued when the support staff complement decreased some years ago. In the department al response to the external reviewers' report, the Physics department agreed that “a senior level experimental course is needed within the curriculum”, and that the Curriculum Committee will be investigating, in 2013-2014, the creation of this course.

With the aim of reducing the cost of program, the reviewers recommend that the Physics department investigate the provision of “service” courses to the anticipated “School of Environmental Science”. The Dean agrees with this recommendation, noting that “Physics is a fundamental discipline required for many science degrees” and “exposing a maximum number of students to topics taught in Physics will improve the competitiveness of our graduates.” On the other hand, the Dean notes that the Physics Department already teaches “service” courses, such as Physics for Forensic Science, and Astronomy for non-Physicists.

With a looming retirement amongst the Physics faculty, some Physics faculty members feel it is important to secure a faculty replacement; others expressed a preference for increased staff support. The reviewers agree that “the loss of general teaching capacity would, of course, be immediately felt”, but that “the response to that threat must be evaluated in the context of a longer-term strategic perspective.” The reviewers feel more strongly that the appointment of a support staff person “would restore to an otherwise comprehensive program an important element in experimental physics that has recently been diminished.”

In the reviewers' view, the Physics department “delivers rigorous programs with a particularly strong commitment to pedagogic innovation and improvement”, noting and that “the programs are very strong as judged by all the relevant benchmarks”. The Department has "productive and research active" faculty with “a strong record of research accomplishment, as evidenced by strong publication records in leading journals”, and by the fact that almost all faculty in the Department hold individual NSERC Discovery grants. The reviewers acknowledge that the sizes of the programs make them expensive for Trent to run: “the Department has graduated approximately seven students per year.”

On the other hand, they also comment that this compares favourably with other institutions. The Physics major numbers “reflect the reality that Physics is a discipline that does not draw huge cohorts of students.” The reviewers also noted that the programs have a very healthy retention and graduation rate. The reviewers concluded that “The University should recognize and understand the manifest merits of the two programs.”

**PRIORITIZATION OF RECOMMENDATIONS SELECTED FOR IMPLEMENTATION**

*Please note: Only those recommendations selected for implementation are included in this report. Recommendations that do not require report have not been included.*

**Recommendation 3**

**The University should include Physics in any strategic planning around the prospect of establishing a School of Environmental Science. Such a development would provide enhanced opportunities for Physics offerings.**

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| *Approval required by* | *Provost & VP Academic* |
| *Resources provided by* | *Not applicable* |
| *Unit/person responsible for implementation* | *Science Dean* |
| *Recommended implementation date* | *September 2015* |
| *Report on progress of implementation to PQAC* | *November 2014* |

**Recommendation 4**

**The immediate restoration of a staff position (technical, experimental/ lab) to the department complement.**

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| *Approval required by* | *Science Dean* |
| *Resources provided by* | *Science Dean* |
| *Unit/person responsible for implementation* | *Chairs of CHEM, PHYS* |
| *Recommended implementation date* | *September 2014 if budget permits* |
| *Report on progress of implementation to PQAC* | *November 2014* |

**Recommendation 5**

**The department is critically staffed at present, and some form of replacement is essential for the viability of the program. We feel the immediate needs of the teaching program may be met through an increase in Sessional lecturers or an LTA appointment. The reviewers are not persuaded that the loss of particular expertise is a critical threat.**

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| *Approval required by* | *Science Dean; Provost & VP Academic* |
| *Resources provided by* | *Provost & VP Academic* |
| *Unit/person responsible for implementation* | *PHYS Chair; Science Dean* |
| *Recommended implementation date* | *September 2015* |
| *Report on progress of implementation to PQAC* | *November 2014* |

**Recommendation 6**

**The Dean recommends that the Department reintroduce an upper year experimental course in Physics.**

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| *Approval required by* | *USC; Senate* |
| *Resources provided by* | *Science Dean* |
| *Unit/person responsible for implementation* | *PHYS Chair* |
| *Recommended implementation date* | *September 2015* |
| *Report on progress of implementation to PQAC* | *November 2014* |

**Recommendation 7**

**The Dean recommends that the Department, in consultation with the appropriate unit(s) explores the need for and develops a course in Physics for Environmental Sciences**

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| *Approval required by* | *USC; Senate* |
| *Resources provided by* | *Science Dean* |
| *Unit/person responsible for implementation* | *PHYS Chair* |
| *Recommended implementation date* | *September 2015* |
| *Report on progress of implementation to PQAC* | *November 2014* |