Queen's University

Executive Summary of the Review of the Academic Programs in the Department of Physics, Engineering Physics and Astronomy

In accordance with Queen's University Quality Assurance Processes (QUQAP), the Department of Physics, Engineering Physics and Astronomy submitted a self-study on June 24, 2014 to the Faculty of Arts and Science, the Faculty of Engineering and Applied Science, the School of Graduate Studies and the Office of the Provost and Vice-Principal (Academic) to initiate the cyclical program review of its undergraduate and graduate programs. The approved self-study presented program descriptions, learning outcomes, library report and analyses of data provided by the Office of Institutional Research and Planning and the School of Graduate Studies. Appendices to the self-study contained CVs for each full-time member in the Department of Physics, Engineering Physics and Astronomy and the library report.

Three arm's-length reviewers (Jun Nogami, Professor and Chair, University of Toronto; Ken Ragan, Professor and Chair, McGill University; and, Ron Peterson, Professor, Queen's University) examined the materials and conducted a site visit on February 23-24, 2015. The site visit included interviews with the vice-provost (teaching and learning), vice-provost and dean and associate dean School of Graduate Studies, dean and associate dean of the Faculty of Arts and Science, associate dean Faculty of Engineering and Applied Science and meetings with the department head, heads of cognate units, students, staff and faculty.

In their report (March 2, 2015), the review team provided feedback that describes how the Department of Physics, Engineering Physics and Astronomy's programs meet the QUQAP evaluation criteria and are consistent with the university's mission and academic priorities. The review team noted that the Department of Physics, Engineering Physics and Astronomy delivers very high quality and innovative undergraduate and graduate programs in both physics and engineering physics. The review team went on to say that the department has outstanding research groups, specifically in the area of astroparticle physics with the SNO (Sudbury Neutrino Observatory) collaboration.

The review team did report on a number of challenges including: erosion of the faculty complement; aging infrastructure in Stirling Hall; and, uncertainty around the impact of the new budget model

Based on all of the above documentation, a *Final Assessment Report* and an *Implementation Plan* were prepared by the vice-provost (teaching and learning) and approved by the provost (August 31, 2015).

The academic programs in the Department of Physics, Engineering Physics and Astronomy have been approved to continue and are scheduled for their next review in eight years (2022-2023)

Prepared by the vice-provost (teaching and learning) September 8, 2015

Final Assessment Report & Implementation Plan for the Cyclical Program Review of the Academic Programs in the Department of Physics, Engineering Physics and Astronomy

In accordance with Queen's University Quality Assurance Processes (QUQAP), this final assessment report provides a synthesis of the external evaluation and the internal response and assessments of the undergraduate and graduate programs delivered by the Department of Physics, Engineering Physics and Astronomy. This report identifies the significant strengths of the programs, together with opportunities for program improvement and enhancement, and it sets out and prioritizes the recommendations that have been selected for implementation.

The report includes an implementation plan that identifies who will be responsible for approving the recommendations set out in the final assessment report; who will be responsible for providing any resources entailed by those recommendations; any changes in organization, policy or governance that will be necessary to meet the recommendations; who will be responsible for acting on those recommendations; and, timelines for acting on and monitoring the implementation of those recommendations.

Summary of the Cyclical Program Review of the Academic Programs in the Department of Physics, Engineering Physics and Astronomy

The Department of Physics, Engineering Physics and Astronomy submitted a self-study on June 24, 2014 to the Faculty of Arts and Science, the Faculty of Engineering and Applied Science, the School of Graduate Studies and the Office of the Provost and Vice-Principal (Academic) to initiate the cyclical program review of its undergraduate and graduate programs. The self-study presented the program descriptions and learning outcomes, an analytical assessment of the academic programs, and program data including the data collected by the Office of Institutional Research and Planning and the School of Graduate Studies. Appended to the self-study were a number of documents including CVs for each member of Department of Physics, Engineering Physics and Astronomy and the library report.

Two arm's-length external reviewers (Jun Nogami, Professor and Chair, University of Toronto and Ken Ragan, Professor and Chair, McGill University), and one arm's length internal reviewer (Ron Peterson, Professor, Queen's University) were selected by the vice-provost (teaching and learning) in consultation with the dean of Arts and Science and the vice-provost and dean School of Graduate Studies from nominations submitted by the Department of Physics, Engineering Physics and Astronomy. The review team evaluated the self-study documentation and then conducted a site visit to Queen's on February 23-24, 2015. The site visit included interviews with vice-provost (teaching and learning), vice-provost and dean and associate dean School of Graduate Studies, dean and associate dean of the Faculty of Arts and

Science, associate dean Faculty of Engineering and Applied Science and meetings with the department head, heads of cognate units, students, staff and faculty

In their report (March 2, 2015), the review team provided feedback that describes how the Department of Physics, Engineering Physics and Astronomy's programs meet the QUQAP evaluation criteria and are consistent with the university's mission and academic priorities. The review team noted that the Department of Physics, Engineering Physics and Astronomy was committed to providing a rich and valuable student learning experience. In particular, the review team noted that the Department of Physics, Engineering Physics and Astronomy delivers very high quality and innovative undergraduate and graduate programs in both physics and engineering physics. The review team went on to say that the department has outstanding research groups, specifically in the area of astroparticle physics with the SNO (Sudbury Neutrino Observatory) collaboration.

The review team did report on a number of challenges including: erosion of the faculty complement; aging infrastructure in Stirling Hall; and, uncertainty around the impact of the new budget model.

The head, after consultation with faculty and staff in the department, submitted a response to the review team report (March 23, 2015). The vice-provost and dean of the School of Graduate Studies (March 30, 2015), dean of the Faculty of Engineering and Applied Science (April 14, 2015) and the associate dean of the Faculty of Arts and Science (April 15, 2015) also submitted their responses to the provost's office. Specific recommendations were discussed, and clarifications and corrections presented.

Subsequent to receipt of the review team report and the internal responses from the department, the associate dean of Arts and Science, the dean of Engineering and Applied Science and the vice-provost and dean of Graduate Studies, the senate cyclical program review committee (SCPRC) dedicated part of its meeting of June 9, 2015 to this particular discussion.

The SCPRC would like to recognize the following strengths of the Department of Physics, Engineering Physics and Astronomy:

- Delivering high-quality academic programs at both the undergraduate and graduate level;
- Creating a caring, collegial and supportive unit for its students, staff and faculty;
- Excellent students who go on to become successful graduates;
- Excellent research profile;
- Excellent international reputation in particle astrophysics;

The SCPRC would like to identify the following opportunities for enhancement. The department should seek to:

- Strengthen partnerships both internal and external to Queen's (including collaborations with the Royal Military College);

- Continue its application of pedagogical innovations, including active and collaborative; learning opportunities, experiential learning and blended or online learning;
- Create a minor undergraduate degree program in astrophysics.

Summary of the Reviewers' Recommendations with the Head's and Vice-Provost and Dean's Responses

Graduate Student Advising

The review team noted that there is an uneven distribution of graduate students across the department, where the majority of graduate students being advised by only a fraction of the faculty. It was recommended that perhaps the number of graduate students advised can be taken into account in a more explicit manner in the faculty workload document, in terms of a measure of research activity.

The department head responded that this was an interesting idea that he believed had been employed by other departments at Queen's. The issue will be added to the agenda of the upcoming summer departmental retreat.

Improvements to the Departmental Website for Recruitment Purposes

The review team recommended improvements to the departmental website for recruitment purposes at both the undergraduate and graduate levels.

The department head responded that the department had recently ported a great deal of the website into Drupal. However, in this first step, the content of many pages (especially research and program pages) were not updated. The department plans to address this issue over the next year and have already offered faculty support in updating their own research pages.

The vice-provost and dean of the School of Graduate Studies responded that the department may seek resources from the School of Graduate Studies as well as guidance on web content based on the school's applicant survey results.

Streamlining Assessment of Undergraduate Design and Theses

The review team recommended streamlining assessment of undergraduate design and theses, and noted that there is an opportunity to engage off campus professional engineers in both design and thesis projects. The recommendation went on to say that better connections with off campus people and potential employers might also address some of the student concerns about future employment.

The department head responded that this was an excellent idea, especially in the context of the design projects. The department will try to incorporate this recommendation starting in the 2015-16 academic year.

Implementation Plan:

Recommendation	Proposed Follow-up	Responsibility for Leading Follow-up	Timeline for Addressing Recommendation
1. The Department of Physics, Engineering Physics and Astronomy should review the availability of course offerings to ensure they are delivered with sufficient frequency to benefit both its undergraduate and graduate students. During this review the unit should examine its fields of study to determine that the unit can: a) deliver in areas of stated expertise; and, b) expand and highlight certain areas of strength and demand (e.g. medical physics).	A curriculum mapping of all courses to DLEs, LOs and other indicators of achievement in conjunction with the Centre for Teaching and Learning	Department head, associate deans (FEAS, FAS and SGS)	Vice-Provost and dean of Graduate Studies, dean of Engineering and Applied Science and the dean of Arts and Science's *annual report*s to the provost 2016
2. The department should look for additional revenue opportunities, including new programing and advancement prospects to enhance the financial sustainability of its course offerings and to improve the physical space and facilities associated with the unit.	Initiate meeting with vice-principal (advancement), department head and relevant associate deans	Department head, associate deans (FEAS, FAS and SGS)	Vice-Provost and dean of Graduate Studies, and the dean of Arts and Science's *annual report*s to the provost 2016 NB this recommendation amended at request of Dean, Faculty of Engineering and Applied Science to remove her from reporting requirement on recommendation 2.

3. The department should consider creating a 4 plus 1 accelerated option in the physics program (i.e. 4-year undergraduate plus one year masters) for students in Arts and Science and formalizing these options as combined degrees to draw greater attention and awareness of the opportunity.	Initiate meeting with department head and associate deans (FAS and SGS)	Department head, associate deans (FAS and SGS)	Vice-Provost and dean of Graduate Studies' and dean of Arts and Science's *annual report* to the provost 2016

The vice-provost and dean School of Graduate Studies, the dean of Engineering and Applied Science and the dean of Arts and Science shall be responsible for monitoring the implementation plan. The details of progress made will be presented in the deans' annual reports and filed in the Office of the Provost and Vice-Principal (Academic). Monitoring reports will be posted on the university web site.

Final Assessment Report & Implementation Plan

September 16 2015
Approval Date

Vice-Provost (Teaching and Learning)

Signature

Vice-Provost and Dean, School of Graduate Studies

Signature

Dean, Faculty of Arts and Science	 **Signature**	
Dean, Faculty of Engineering and Applied Science	 **Signature**	
Final status of academic programs in the Department of Physics, Engineering Physics and Astronomy	X PLEASE NOTE CHANGE IN DOCUMENT **Approved to Continue**	NB recommendation 2 amended as per Dean Woodhouse's comments
Date of next program review	**2022/2023 Academic year**	