

**YORK UNIVERSITY**

Final Assessment Report - Executive Summary

**Chemistry, BSc, MSc, PhD  
Biochemistry, BSc**

**Faculty of Science**

**Cyclical Program Review – 2013 to 2021**

This Final Assessment Report (FAR) provides a synthesis of the cyclical review of the programs listed below.

**Programs Reviewed:**

Chemistry, BSc, MSc, PhD

Biochemistry, BSc

**Reviewers appointed by the Vice-Provost Academic:**

Dr. Kim Baines, Distinguished University Professor, Department of Chemistry  
Western University, Ontario

Dr. Louise Dawe, Associate Professor, Department of Chemistry, Wilfrid Laurier  
University, Ontario

Dr. Mark Hayward, Associate Professor, Department of Communications and Media  
Studies, York University

**Cyclical Program Review Key Milestones:**

Cyclical Program Review launch: September 15, 2021

Self-study submitted to Vice-Provost Academic: December 1-12, 2022

Date of the Site Visit: March 13-14, 2023

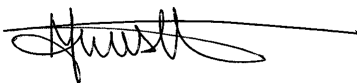
Review Report received: May 11, 2023

Program Response received: July 14, 2023

Dean's Response received: August 14, 2023

Implementation Plan and FAR confirmed by Joint Sub-Committee on Quality Assurance,  
December 4, 2023.

Submitted by Marcia Annisette, Vice-Provost Academic, York University



This review was conducted under the York University Quality Assurance Protocol,  
August 2020.

## **SITE VISIT: March 13-14, 2023**

The virtual site visit was organized around a set of meetings with the following individuals and groups: The first meeting was with Vice-Provost Academic Lyndon Martin and the Dean of Graduate Studies, Thomas Loebel, followed by a meeting with the Chair of the Department, Jennifer van Wijngaarden, the Undergraduate Program Director, Derek Jackson, and the Graduate Program Director, Dr. Robert McLaren. The reviewers also met with Rui Wang, Dean of Science and subsequently, the Associate Dean Curriculum and Pedagogy, Hovig Kouyoumdjian, and Associate Dean Students, Mike Scheid, and the Associate Dean, Research and Partnerships, Vivian Saridakis. Meetings were held with University Librarians, Departmental administrative staff and with a group of technical staff, including the Senior Laboratory Technician, the NMR Specialist, and 5 other laboratory technicians. Faculty members focused on first year courses met with the reviewers, followed by those focused on the undergraduate program, and then those involved with the graduate program. An additional meeting slot for Faculty members was also held. Undergraduate students and graduate students met in separate groups with the reviewers. The reviewers note in their report that an in-person visit would have been preferable and that in future, meetings should be arranged with faculty teaching mandatory undergraduate program components in the Biology Department, as well as staff members. At the request of the reviewers, a written statement from Robert Tsushima, Chair of the Biology Department was provided.

## **OUTCOME:**

The Joint Sub-Committee on Quality Assurance received the Program and Decanal responses to the recommendations and has approved an implementation plan.

A report on the progress of the initiatives undertaken in response to recommendations in general and as specified in the implementation plan will be provided in the Follow-up Report which will be due 18 months (July, 2025) after the review of this report by the York University Joint Sub-Committee on Quality Assurance.

The next Cyclical Program Review will begin in the Fall of 2029 with a site visit expected in the Fall of 2030 or Winter of 2031.

## **PROGRAM DESCRIPTION AND STRENGTHS:**

The Department of Chemistry offers a variety of BSc Degree options in Chemistry and in Biochemistry (with Biology). In addition to the Specialized Honours BSc options in Chemistry and Biochemistry, the Chemistry Department offers a Pharmaceutical and Biological Chemistry Stream which the reviewers describe as “unique, and as such, also highlights innovative programming”. The reviewers noted, “The Specialized Honours programs are accredited by the Canadian Society for Chemistry. The goal of these programs is the development of professional chemists with broad foundational knowledge and depth in their specialized area. The second goal of these programs is to

provide experiential research activities to prepare students for lab-based post-degree programs or careers.” The Honours major and 90-credit BSc degree options offer students greater flexibility and are suited to students who may wish to pursue professional degrees in dentistry or law.

The reviewers state, “Creative and appropriate assessments are used at all levels. Special credit should be noted for the first-year teaching team, which is committed to providing students with opportunities to demonstrate problem-solving skills by including “long answer” problems on tests and final exams.” They note that the professional skills program accompanying the 4<sup>th</sup> year research course is innovative but needs further development.

Challenges were acknowledged with the Honours and Specialized Honours Biochemistry options in terms of academic advising, the matching of supervisors for fourth year research course (CHEM/BHM 4000), the scheduling of volunteer lab work required prior to that course, and the opportunity to engage in co-op placements that are coordinated through the Faculty of Science rather than the Department.

The Graduate Program in Chemistry offers MSc and PhD degrees that have been in existence since 1965. The master’s Program offers a full-time master’s degree by Research Thesis and a part-time master’s degree by course work. Generally, the master’s by Research Thesis is the predominant stream chosen by >95% of entering master’s students. The Doctoral degree in Chemistry is a full-time research program.

The reviewers note that the graduate program requirements and learning outcomes are clear and that the major research requirements support the program learning outcomes well. They noted, “The primary method for assessing graduate student achievement is through annual research evaluations which are carried out in the spring in conference-style presentations and subsequent evaluations. This style of evaluation is innovative and unique.” The preparation for these may be stressful for students, but the benefits of preparation for their defense, self-reflection on progress through the degree, enhanced presentations skills and the building of community benefit both MSc and PhD candidates. The reviewers indicate that a clear delimitation of graduate program expectations, including the time to completion, should be laid out clearly for students.

The reviewers note that faculty members should emphasize the development of professional and leadership skills, a critical component of the program for graduate students. There is generous support from the Faculty of Science and the TA union and support from supervisors.

The reviewers suggest the Department develop clearly articulated objectives for each undergraduate program. In addition, both the undergraduate and graduate program objectives related to equity, diversity and inclusivity should be developed.

## IMPLEMENTATION PLAN

The chart below lays out the implementation plan approved by the Joint Sub-Committee at its meeting in December 2023.

	Recommendation	Action	Responsible for Follow-up	Timeline
A.	That the Chemistry Department consider the thoughtful considerations for development provided by the reviewers in their report as part of their ongoing plans for enhancement of programs.	The Department will consider these considerations, and act on them as feasible. The Follow-up Report should summarize actions taken on these items.	Chair, Undergraduate Program Director, Graduate Program Director	Summary of actions undertaken to be included in the Follow-up Report due June, 2025
1.	That the Department develop an academic plan in consultation with stakeholders complete with a vision, mission objectives and specific action items. In addition to actions already identified by the Department, the academic plan should include the following:			
1a)	That the Department develop strategic actions to enhance the diversity of people in the Department (from students to faculty)	The Department will continue the implementation of the departmental Decolonization, Equity, Diversity and Inclusion (DEDI) committee and collaborate with the Faculty of Science committee.	Chair, Chemistry Chemistry DEDI committee	Fall 2023 and ongoing
1b)	That the DEDI initiatives be embedded in Chemistry program learning outcomes.	The department will explore the development of department-wide DEDI strategies, drawing on	Chair, Chemistry Undergraduate Program Director, Graduate Program Director,	Discussions to begin in Fall 2023 and continue. Review progress in Fall 2024.

		York's DEDI Strategy 2023-28 and report on progress by Fall 2024. The department will encourage all instructors to use / adapt DEDI resources developed by the Faculty of Science.	Chemistry DEDI committee	
1c)_i	That capstone experiential activities, beyond lab experiences, be developed.	The Department will explore the development of experiential experiences for students through stronger liaison and partnership with the Faculty's Experiential Learning Coordinator, industry contacts and alumni and report on progress in this area by Fall 2024. The Department has indicated it will appoint a faculty member to focus on this initiative.	Chair, Department of Chemistry	Fall 2023 and ongoing Review of progress in Fall 2024
1c)_ii	That the Department partner with York's Cross-Campus Capstone Classroom (C4) to provide students with opportunities to develop skills and work with students in other programs	The program will ensure students are aware of this important opportunity, and faculty members will be encouraged to collaborate and oversee chemistry-related projects. The question of satisfying fourth year requirements will be explored for Chemistry and other Science programs.	Undergraduate Program Director Associate Dean of Curriculum and Pedagogy, Faculty of Science	Ongoing

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1c)_iii	That a consistent schedule of professional development opportunities be developed for CHEM/BCHM4000.	The course director will develop a consistent schedule, consulting with the Associate Deans of Research, and of Curriculum and Pedagogy.	Undergraduate Program Director Course director, CHEM/BCHM 4000 Associate Dean Curriculum and Pedagogy	Fall 2023 for pilot and then ongoing
1 d)	That research experiences for 2 <sup>nd</sup> and 3 <sup>rd</sup> year level students be established	The Department will continue to promote the practicum options and explore additional for-credit options for student research courses.	Chair, Chemistry Undergraduate Program Director	Ongoing
2.	That the undergraduate laboratory equipment be revitalized with a complete overhaul.	The Department will develop a comprehensive plan for revitalization of undergraduate lab equipment to the Science Dean's Office.	Chair, Chemistry Undergraduate Program Director Senior Lab Technician	Fall 2024
3.	That opportunities and space for building community continue to be developed.	The Department will continue enhancing existing space and explore additional gathering places. The Chair will consider tasking students and faculty members with ensuring that information posted for students is kept current.	Department, faculty, and students Chemistry Operations Manager	Winter 2024 and ongoing