18-Month Follow-Up
FINAL ASSESSMENT REPORT
Executive Summary
December 2020
Bachelor of Science in Chemistry
Dean: Dr. Greg Crawford

Under Ontario Tech University's Quality Assurance Framework, all degree programs are subject to a comprehensive review every eight years to ensure that they continue to meet provincial quality assurance requirements and to support their ongoing rigour and coherence. Program reviews involve several stages, including:

1. A comprehensive and analytical self-study brief developed by members of the program under review.
2. A site visit by academic experts who are external to and arm's length from the program who prepare a report and recommendations on ways that it may be improved based on a review of the program's self-study and supporting material, and a two day site visit involving discussions with faculty, staff and students and a tour of the facilities.
3. Development of a plan for improvement by the program and proposed timelines for implementation.

All programs that undergo a review must provide a report eighteen months after the completion of the review to gather information on the progress that has been made implementing the agreed upon plans for improvement.

In 2017-2018 a program review was scheduled for the Bachelor of Science in Chemistry, with a site visit in February 25-26, 2019**.** The program has submitted to the Provost's Office a comprehensive chart outlining the progress they have made made relative to the action plans resulting from the review. A summary of this progress is provided on the following pages. The summary report is reviewed by the appropriate standing committee of Academic Council, and is subsequently reported to Academic Council and the Board of Governors.

Next Scheduled Program Review: 2024-2026

Action Items	Process Status	Comments
1. Pursue Accreditation a) Investigate process, requirements, timelines, costs b) Develop a plan and associated timelines for accreditation application	In Progress	Preliminary work on this began in Fall 2019. A variety of challenges beset the Chemistry program faculty, including various leaves (some expected, some not), as well as consequences of the COVID-19 pandemic, which led to some temporary reprioritization. We intend to return to this topic in March 2021, when a key individual is expected to return from leave.
2. Re-examine Admission Requirements and Determine What, If Any, Changes Will be Made for Fall 2020 Admissions	Continuous	No changes were made for the Fall 2020 admissions, but the relevant requirements are periodically discussed.
3. Review Chemistry Curriculum, In Light of Reviewer Recommendations, and Implement Appropriate Changes	In Progress	As recommended, an introduction to energy levels (vibrational and rotational) has been added to CHEM 2010U – Structure and Bonding, in order to provide a background for CHEM 3040U – Fundamentals of Physical Chemistry. In accord with recommendations, CHEM 4040U – Physical Chemistry: Surfaces and Colloids and CHEM 4060U – Quantum Chemistry and Spectroscopy have remained as core courses in the regular Chemistry program. However, CHEM 2030U – Analytical Chemistry continues to be considered a reasonable prerequisite (to remain) for CHEM 2040U – Thermodynamics and Kinetics, since it provides a necessary level of general laboratory

		experience. In addition, one CHEM 2040U lab (on error analysis) uses material taught in CHEM 2030U and not in CHEM 2040U. The requirements of successfully completing CHEM 2030U also filters students to match the available laboratory capacity for CHEM 2040U, which could well be exceeded otherwise. The proposed transfer of CHEM 3510U - Inorganic Chemistry I to 2nd year for an earlier experience with the subject would create difficulties for students due to the needed higher level of material (namely on symmetry and crystal/ligand field theory). Similarly, making CHEM 2220U – Molecular Structure Determination on Spectroscopic Data an optional 4th year course, as suggested, could undermine the needed preparation of students (specifically in spectra analysis, molecule-structure prediction, report writing) for the 4th-year thesis courses. Therefore, these last two changes have not been pursued. The recommended shift of CHEM 2220U – Molecular Structure Determination from Spectroscopic Data from the 2nd to a later year would be best implemented by shifting this course back to the 3rd year, where it was placed originally but moved in order to alleviate the difficulty of 3rd year. This change continues to be reviewed. Additional curricular changes continue to be assessed and reviewed. Discussion around curricular changes will be on-going particularly with renewed review of accreditation.

4. Review Student Workload in Laboratories and Modify as Appropriate: a) Pilot changes in at least one lab course and assess consequences b) Implement changes in other lab courses as deemed appropriate	a) In Progress b) In Progress	In Winter 2020, a laboratory-report writing workshop was implemented in CHEM 2040U – Thermodynamics and Kinetics to better explain expectations to students. Students were also offered incentives (bonus marks) for handing reports in early - as an attempt to get them to start working earlier in the hope that they would discover their difficulties and be able to seek help. To reduce, as recommended, the workload of writing reports, in CHEM 3040U – Fundamentals of Physical Chemistry, and CHEM 4040U – Physical Chemistry: Surfaces and Colloids: • the requirement to answer questions was eliminated; • students were given suggested limits (500 - 750 words) for the introductions and discussion sections. The resulting consequences are to be assessed in later years, when they will exhibit themselves. Changes in other courses continue to be reviewed and will be implemented gradually over the next two years.
5. Enhancing Student-Faculty and Student-Student Engagement Outside the Curriculum: Review Options, Pilot One-Two Events, and Assess Next Steps	On hold	This has been postponed in view of the COVID-related limitations. The Chemistry faculty group are committed to reengaging in this item, hopefully for the Fall of 2021.

6. Laboratory Infrastructure Concerns: a) Review concerns brought forward by reviewers and faculty; assess the relative importance and urgency of each b) develop plan to address urgent issues and prioritize those items that are less urgent	a) Complete b) Complete	A thorough review was overseen by M. Calhoun, H&S Officer. The review included various key documents (e.g., building codes, site drawings, OHSA consultant remarks; code compliance; certificate of approval) and various consultations (e.g., managers/directors of campus infrastructure, risk management, emergency management; architectural planner; architectural consultant). A Hazard Investigation Report was written by M. Calhoun (Dec. 11, 2019). No major structural changes (e.g., 2nd access doors) are deemed required. Minor recommendations (e.g., installation of additional fire extinguishers and spill kits; incident response training for students; development of an emergency response procedure) have been implemented.
7. Staffing: a) Seek Permission to Hire Chemistry TF for Summer 2020 b) Seek Permission to Hire Chemistry TTT for 2022 c) Review Options for Hiring Senior Undergrad Tas	a) On hold b) On hold c) On hold	A Chemistry TF hire was initially proposed in Fall 2019, with the goal of hiring in Summer 2020. Much discussion at the faculty level occurred regarding the qualifications and expectations of such a position. Institutional budget challenges, tied in part to the COVID-19 pandemic, led to this position not being approved. The Dean is currently reappraising the case for such a position for the 2021-22 cycle. Any additional faculty hires are likewise expected to be delayed. Additional cuts to the Faculty's TA budget have likewise delayed the discussion around hiring senior undergrads as TAs.

8. Convey Faculty and Reviewer Perspective on CRC to Senior Management.	Complete	The Dean shared the perspective of the Chemistry faculty and the external reviewer with the Provost in the Fall of 2019.
9. Formalize Volunteer Policy: a) Seek to establish a committee and review current version of draft policy and make any preliminary revisions. b) Submit draft policy to institutional policy approval process.	a) Complete b) Complete	Due to the larger-scale implications, this endeavour was ultimately overseen by the University Secretary/General Counsel. An institutional-level volunteer policy was approved in November 2020.

Process Status Legend:

***Complete**: Accomplished action item; no further steps required.*

***Continuous**: Initial action item complete but requires ongoing monitoring and/or enhancement.*

***In Progress:** Progress on action item has been initiated but is not complete at this time. Outline all steps taken in the comment's column.*

***On Hold**: Unable to complete due to other dependent factor(s)*

***Cancelled**: Item no longer relevant or resources unavailable*