

Two-Year Progress Report

General and Honours Science (BSc)

April 2020

Background

In accordance with the University's Institutional Quality Assurance Process (IQAP), a self-study was submitted by the Dean of Science Office to the Associate Vice-President, Academic in June 2017. The self-study presented the program descriptions and learning outcomes, an analytical assessment of the program, data collected from a student survey, and the standard data package prepared by the Office of Institutional Analysis & Planning (IAP).

Two arm's-length external reviewers and one internal reviewer examined the self-study documentation and then conducted a site visit on December 5 and 6, 2017. The visit included interviews with the Associate Vice-President, Academic; Dean of Science; Science Associate Dean, Undergraduate; Science Associate Dean Co-op, Computing and Special Projects; Science Associate Dean, Student Relations; Science Associate Dean, International Programs, and a number of faculty members, staff and current students. The review team also had an opportunity to visit teaching rooms, undergraduate laboratories, student study and club spaces, and meet with representatives from the Library.

The Final Assessment Report was approved by Senate Undergraduate Council (SUC) in September 2019.

Progress on Implementation Plan

Each recommendation in the Final Assessment Report is listed below, with a status update. Rationales for altered implementation are provided.

Recommendations

1. **Need for improvement of conveying and integrating information at all levels: website, Faculty of Science, service department pages:** The reviewers suggest that improving the profile of the General Science program would have a significant impact on enrolment, while better advertising of the Honours Science program and engagement with the students will help build a sense of community.

Status: **completed**

Details: Enrolment in the General Science program will continue to occur almost entirely involuntarily (~99%), thus the focus on this plan needs to remain on retention in terms of

degree completion, plan modification or internal transfer, as appropriate. Support of General Science students includes face-to-face (FTF), individual advising with the General Science academic advisor and, since the program review, enhanced email outreach to at-risk students that has increased FTF advising, and new sessions such as “*Understanding your First Year Science Standing*” (see more in Recommendation 5). Strategies to improve the profile of the General Science program have focused on webpage development.

The Faculty of Science ‘[Programs](#)’ webpages were re-organized for all BSc majors available through application to the Ontario Universities Application Centre (OUAC); this re-organization has facilitated better integration of information of interest to future and current students. The [Honours Science webpage](#) was enhanced to include: admission information, exemplar course outlines, program-specific Science Ambassadors, popular complementary minors, and skills attained. A new [General Science webpage](#) was created to include information on popular complementary minors, and skills attained.

2. Strengthen online course delivery as integral to program offerings in The Faculty of Science:

The reviewers recommend a two-pronged approach: a) training of faculty in course delivery methodologies; b) facilitation of prompt and nimble development of courses.

Status: in progress

Details: Two online courses have been added since the review period: EARTH 121, Introduction of Earth Sciences (Fall 2017) and BIOL 359, Evolution 1: Mechanisms (Spring 2019). Enrolment has been strong in both: EARTH 121 (>150, on average); BIOL 359 (>170, on average). While both these courses are available to the small number of students enrolled/admitted in the online General Science BSc program, there remain insufficient Science courses to complete the degree with UWaterloo courses. Thus, the application portal to the online degree has been temporarily closed (Fall 2019) until the number of online courses is further increased. Science’s priority on online learning has increased in view of the impacts on course delivery created by COVID-19. Towards this end, the Dean of Science struck a Science Remote Learning Task Force in Winter 2020.

3. Provide program pathways that are inclusive of all students, including access to labs, course, and 400 level courses that are distinguished from 300 level courses: Developing pathways that can be used as examples by students to guide them in their course selection will help resolve some of the challenges posed by the flexibility of the program. Members of the advising team have already developed informal examples and it is recommended that these be formalized and made available through the Waterloo website.

Status: completed

Details: Prerequisite ‘trees’ were created for the following Science BSc subjects: BIOL, CHEM, EARTH, MNS, and PHYS. In most cases, these are complex trees, thus the initial product was paper-based and available strictly for in-office advisor-student consultations (Winter 2019). As of Winter 2020, online versions are available on the [Program Requirements](#) page (see ‘Science course planning resources’); work continues to enhance their accessibility.

A [1.0 unit, 400 level Science course requirement](#) was added to the Honours Science program (effective, 2019-2020) to bring it in line with other Honours BSc programs offered in the Faculty of Science.

4. **Enrich the student experience for Canadian and international students to develop a community of learners:** Encouraging greater interaction between Canadian and international students will enrich the experience for both groups. Perhaps consider involving Canadian undergraduates in the English language training taken by international students before commencing their program in order to better integrate the two groups.

Status: **completed**

Details: As of Fall 2018, a 0.5 unit ‘Communication in the Sciences’ course requirement was added to Year One of all Faculty of Science BSc majors (SCCOM 100 during 2018-2019; ENGL/SPCOM 193 as of 2019-2020). This writing-intensive course enhances communication skills, using Science-specific sources. Year One students take the course in either the Fall or Winter terms, depending on their academic plan. The mixture of domestic and visa students in small-enrolment (25 cap) sections, has helped integrate students from different communities.

Performance in the course is assessed each term, with a full analysis for a given year being possible after the Winter term. With Winter 2020 grades still being submitted, the following data represents the first full year review for the 2018-2019 cohort (n=1,285):

Metric	Finding
Failure rate	1.4%
Average SCCOM 100 grade	80
<ul style="list-style-type: none"> • Citizens (970) • Perm Residents (70) • Study Permits (244) 	<ul style="list-style-type: none"> • 81 • 79 • 77
Grade-to-Term GPA Ratio ¹	1.09
<ul style="list-style-type: none"> • Citizens (970) 	<ul style="list-style-type: none"> • 1.10

¹ Grade-to-Term GPA Ratio: equals the mean of each student’s SCCOM 100 grade divided by their term GPA in the term they took the course (inclusive of SCCOM 100) for the specified sample. This ratio adds context to the average grade by adjusting for the student’s relative performance in all their courses.

<ul style="list-style-type: none"> • Perm Residents (70) • Study Permits (244) 	<ul style="list-style-type: none"> • 1.07 • 1.04
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These data show that few students fail the course and most students perform well in the course, such that it improves their term average. On average, students who are Canadian citizens achieved a higher grade than students with international study permits. For students with permanent resident status or international study permits, SCCOM 100 grades are on average higher, albeit by a smaller margin, than in their other courses. SCCOM 100 instructors (22) feedback was positive about the course learning outcomes and the ability of the course to facilitate a community of learners.

Metric	Average
Average SCCOM 100 grade <ul style="list-style-type: none"> • Honours Science (161) • General Science (24) 	80 (plan range: 71-83) <ul style="list-style-type: none"> • 81 • 71
Grade-to-Term GPA Ratio <ul style="list-style-type: none"> • Honours Science (161) • General Science (24) 	1.09 (plan range: 1.03-1.18) <ul style="list-style-type: none"> • 1.09 • 1.18

These data show that Honours Science students cannot be differentiated from the cohort average performance. General Science students performed in SCCOM 100 the least well—6% lower than the next lowest Honours Science BSc plan; however, they performed the best relative to their term GPA.

A ‘Study Buddies’ program offered during the program review has since been eliminated because:

- There was a mismatch between interested students (mostly physical sciences programs) and potential study buddies (mostly life sciences programs), thus interested students and volunteers were disappointed.
- The course-based model on which it was based was very laborious to process.
- The ‘Communication in the Sciences’ course provided constructive interactions among English language learners and domestic students.
- More recently, other campus and Science initiatives became available to point students toward (see next points).

There are a number of other university or Science initiatives that allow domestic and international students to make connections:

- Science students on a study permit are encouraged to engage in the Student Success Office [International Peer Community](#) and/or Renison University’s [Conversation](#)

[Partner Program](#), with volunteers for the latter program being able to use their hours toward their cross cultural volunteer experience component of the [Global Experience Certificate](#). Such opportunities help domestic and international students make connections.

- A part-time Science Transition Coach position was created in Fall 2017 and continues. A Science graduate student on a study permit provides coaching for in-coming Science UG students on a study permit.
- For the Fall 2020 admissions cycle, an International Science student recruitment video was created with current Science students here on a study permit, and a 6-month contract position was funded to focus on international Science student recruitment and conversion.

5. **Manage the student experience from admission to graduation by integrating functions in many areas currently available:** This process is already ongoing but continually working to integrate the efforts of the different groups working with students will improve the experience. Advising groups across campus meet monthly, but there are opportunities for more integration with the Library and the Writing and Communication Centre.

Status: completed

Details: Between Fall 2018 and Winter 2020, several initiatives have been implemented to improve student experience throughout undergraduate degree studies in the Faculty of Science. These include:

- Enhanced 1A/1B targeted email outreach, based on LEARN grades and course engagement
- New academic progression (AP) transcript text spreadsheets that increase advisor efficiency and highlight at-risk students
- Introduction of the 'Understanding your First Year Science Standing' session for 1A students that particularly draws at-risk students, some of whom have just been moved from their Honours BSc plan to General Science
- Enhanced 'front-end loaded' course-selection advising in the summer before 1A Honours Science students arrive to help them select courses best aligned with their Science interests
- Introduction of 'Honours Science Checklist' sessions and continuing work with colleagues in the Registrar's Office to enable Honours Science students to run academic requirements on Quest
- Highlighting of Honours Science recruitment 'Science Ambassadors' on the program's webpage
- Collaboration with EDGE for students involuntarily entering General Science
- Collaboration with Centre for Career Action (CCA) career advisors to offer sessions for first and final year students

- Creation of a Science Undergraduate Office (SUO) 'Student Resource Room', where students can book individual sessions with: CCA career advisors; Student Success Office (SSO) peer success coaches; MATES; and Science Coach.

Updated Implementation Plan

	Recommendations	Proposed Actions	Responsibility for Leading and Resourcing (if applicable) the Actions	Timeline for addressing Recommendations
1.	Need for improvement of conveying and integrating information at all levels: website, Faculty of Science, service department pages	Develop new program-specific webpages a. Reorganize Science program webpages b. Enhance program specific, Honours Science webpage c. Develop program specific, General Science webpage	Faculty of Science Manager, Academic Advising	Completed (W'2019 to W'2020)
2.	Strengthen online course delivery as integral to program offerings in the Faculty of Science	Initiate incremental increase in online Science course offerings a. Develop 1 course/18 months i Fall 2017: EARTH 121 ii Spring 2019: BIOL 359 b. Develop courses specific to online General Science program i Above courses ii Online application portal temporarily closed until enough online Science courses available	Associate Dean of Science, Undergraduate Studies (in consultation with Dean and Science department chairs)	In progress (2017 to present)
3.	Provide program pathways that are inclusive of all students, including access to labs, course, and 400 level courses that are distinguished from 300 level courses.	Develop pre-requisite trees (for program-specific webpages) a. Create prerequisite tree (Winter 2019: paper version; Winter 2020: online version) b. Add 400 level course requirement to Honours Science program	Science Manager, Academic Advising Associate Dean of Science, Undergraduate Studies	Completed (W'2020) Completed (2019-2020 calendar)

4	Enrich the student experience for Canadian and international students to develop a community of learners.	<p>Investigate increased opportunities for domestic and international student interactions</p> <ul style="list-style-type: none"> a. 'Communication in the Sciences' course for all Science students (domestic/visa mix) b. Part-time 'Science Transition Coach' position for visa students 	Science Manager, Academic Advising	Completed (F'2018 to F'2019)
5	Manage the student experience from admission to graduation by integrating functions in many areas currently available	<p>Investigate increased opportunities for positive student experiences.</p> <ul style="list-style-type: none"> a. Enhanced 1A/1B targeted email outreach (via Learn scrapping) b. Academic Progression (AP) transcript texts, highlighting at-risk students c. 'Understanding your 1A Standing' sessions d. 'Honours Science Checklist' sessions e. Honours Science ambassadors f. EDGE advising for students entering General Science through failure g. CCA career advisor sessions for first and final year students h. SUO resource room (CCA, SSO peer coaches, MATES, Science Coach) 	Associate Dean of Science, Undergraduate Studies	Completed (W'2019 to W'2020)

The Associate Dean, Undergraduate Studies, in consultation with the Dean of the Faculty shall be responsible for monitoring the Implementation Plan.

Date of next program review: _____ **2024-2025** _____
Date

Signatures of Approval:

 _____ *April 30, 2020* _____
Chair/Director Date

AFIW Administrative Dean/Head (For AFIW programs only) _____ Date

Robert P. Lemieux Lemieux
Digitally signed by Robert P. Lemieux
Date: 2020.04.30 13:44:30 -04'00'

Faculty Dean _____ Date

Note: AFIW programs fall under the Faculty of ARTS; however, the Dean does not have fiscal control nor authority over staffing and administration of the program.

 _____ August 20, 2020 _____

Associate Vice-President, Academic _____ Date
(For undergraduate and augmented programs)

Associate Vice-President, Graduate Studies and Postdoctoral Affairs _____ Date
(For graduate and augmented programs)