



## FINAL ASSESSMENT REPORT Executive Summary Cyclical Program Review

<b>Degree Program:</b>	<b>Bachelor of Science (Hons), Biological Science</b>
<b>Components:</b>	<b>Biomedical Science, Environmental Biology, Applied Biotechnology, Marine Biology</b>
<b>Dean:</b>	<b>Dr. Ken Wilson</b>
<b>Date:</b>	<b>March 18, 2025</b>

Under Ontario Tech University's Institutional Quality Assurance Process (IQAP) and the Ontario Quality Assurance Framework (QAF), all programs are subject to a comprehensive review at least/at minimum every eight years to ensure that they continue to meet provincial quality assurance requirements and to support their ongoing rigour and coherence.

In academic years 2022-2024 a program review was scheduled for Bachelor of Science (Hons), Biological Science. This is the third program review for this program. A timeline of the review is provided below.

<b>Program Review Timeline</b>	<b>Date</b>
Program Review start date:	November 8, 2022
Self Study submitted/approved:	August 26, 2024
Site Visit:	November 14-15, 2024
External Reviewers Report received:	December 11, 2024
Program Response received:	January 21, 2025
Decanal Response received:	March 4, 2025

Based on the self-study, the reviewers were asked to provide recommendations on differentiating the nomenclature of the biology specializations, provide an assessment of the recruitment and retention of biology faculty, and appraise the experiential learning opportunities for senior students.

The review consisted of two external reviewers. During the in-person site visit, the reviewers met with the following groups and individuals:

Dr. Lori Livingston, Provost and VP Academic  
 Dr. Ken Wilson, Dean of the Faculty of Science  
 Dr. Robert Bailey, Chair of Internal Assessment Team  
 Members of the Internal Assessment Team  
 Faculty, Staff and Students from the Faculty of Science

The external reviewers identified six recommendations identifying specific steps to be taken to improve the program. Themes emerging from the recommendations include restructuring specializations, changes to course requirements, increasing experiential learning opportunities and improving the student experience. The prioritized list of recommendations is available in the Implementation Plan.

A Final Assessment Report (FAR) has been prepared to synthesize the reports and recommendations resulting from the review, identifying the strengths of the program as well as the opportunities for program improvement and enhancement. The Implementation Plan (IP) presents a timeline of the follow-up and resource requirements addressing the recommendations from the external reviewers' report. Both documents, accompanied by this Executive Summary (ES), were delivered to the appropriate standing committee of Academic Council (USC/GSC) and approved on **March 18, 2025**.

Governance	Document(s)	Type of review	Date
Faculty Council	IP	Feedback	March 4, 2025
Resource Committee	IP	Resource review	March 11, 2025
USC/GSC	FAR, ES, IP	Approval	March 18, 2025
Quality Council	FAR, ES, IP	QAF requirement	
Academic Council	ES, IP	For information	
Board of Governors	ES, IP	For information	
Corporate Website	ES, IP	QAF requirement	

**Due Date for 18-Month Follow-up Report: September 1, 2026**

**Date of Next Cyclical Review: 2030-2032**

**Timeframe for associated site visit: Fall 2031**



**IMPLEMENTATION PLAN**  
**March 18, 2025**  
**Bachelor of Science (Hons), Biological Science**  
**Program Review**  
**Dean: Dr. Ken Wilson**

The Implementation Plan is a critical outcome of the Cyclical Program Review process. The Dean solicits feedback on the Implementation Plan through Faculty Council and the plan is reviewed by the Provost, through the Resource Committee, to examine resource implications and allocations. A Final Assessment Report (FAR) and Executive Summary are prepared synthesizing the program review reports and responses, following review of the Implementation Plan by the Resource Committee. The plan proceeds through Ontario Tech’s governance process and is posted on the corporate website.

The table below presents a timeline of the follow-up and resource requirements addressing the recommendations from the external reviewers’ report.

<b>Recommendation</b> <i>(corresponding # from reviewers’ report)</i>	<b>Action Item(s)</b>	<b>Specify role of person responsible</b>	<b>Timeline for action and monitoring</b>	<b>Resource Requirements</b>
<p><b>1. Hiring:</b></p> <p>Hire faculty (Research stream and Teaching stream) to replace recent retirements.</p> <p>Perhaps one of these hires could be in Animal Physiology so courses that support the Biomedical specialty could be offered, such as histology, anatomy, immunology, neurology, epidemiology, nutrition, virology, microbiome, infectious disease biology, etc. The new</p>	<p>A Teaching Faculty position is currently open and a search is being conducted. The subject area in the advertisement is seeking someone to teach introductory Cell/Molecular Biology, Animal Physiology, and Neurobiology</p>	Dean	Ongoing and planned for fall 2025	Final approval on bioinformatics search

	<p>faculty could also work in model organisms such as Zebrafish (for which there would appear to be some capacity here in the aquatic facilities) or Drosophila, which will bring complementary expertise and new courses to Ontario Tech.</p> <p>Another potential new hire would be someone with expertise in Bioinformatics. Perhaps the program could obtain a new position in conjunction with Computer Science but it would be necessary to ensure there is a Biological component to the candidates' research such as analysis of large biological datasets (i.e. RNAseq, large-scale genomics, proteomics, metabolomics).</p>	<p>Hiring someone with expertise in bioinformatics and large data set analysis is on our wish list. It may be a joint hire via Computer Science or Math.</p>			
2.	<p><b>Re-structuring specializations</b></p> <p>Proceed with the name changes of the Environmental Biology specialty to Ecology and Environmental Sciences, and Biotechnology to Cell and Molecular Biology. These new names align better with the courses offered and are more specific so students and their parents will have a better understanding of the programs with the new names.</p> <p>Clearly distinguish the Biomedical Specialty in Biology from the Human Health Science program. This means highlighting the advantages of the Biomedical Program such as COOP, research opportunities, and wider selection of courses.</p> <p>Consider inviting back graduates working in different fields (medicine, dentistry, veterinary, pharmacy, graduate school, laboratory research) to</p>	<p>We are initiating a large-scale revamp of the science curriculum. This will involve looking at all of the specializations. Their names and importance to the Biology Program will be assessed and changes made when they make sense in the greater context.</p> <p>We are developing a science-wide marketing plan and looking to hire a co-op student to put the plan into action. This will include reaching out to alumni and "near graduates" (some of our successful students left the program prior to</p>	<p>Dean, UPD, program faculty members, CIQE, Registrar's Office</p>	<p>Through the 2025/2026 academic year. Work will begin once exams end with course and program changes submitted for approval in 2025/26.</p>	<p>Support from CIQE related to how to message and path the required changes.</p> <p>Support from the Registrar's Office related to marketing and external communications will be helpful.</p>

<p>give mentoring sessions. The overview of the Biological Science program on the OTU website states, "this program provides an excellent basis for writing the MCAT exam and for satisfying course requirements for applying to professional programs in medicine, pharmacy and dentistry. This is too narrow of a description of the Biological Science program that also encompasses studies in Molecular and Cellular Biology, Ecology and Environmental Science as well as Biomedical Science. Only 1 – 2% of students who applied are admitted to Canadian medical schools, so other career opportunities should be promoted.</p> <p>Remove Marine Biology as a separate specialty as there are no permanent faculty or even OTU sessional instructors with this expertise. All courses in this specialty require enrollment for a term in BIOS in Bermuda that is expensive (~\$30K?) so this disadvantages students who cannot afford this. If Marine Biology is kept, it should be moved under Environmental Biology specialization.</p> <p>The Dean mentioned a possible name change of Biology and Business Management to Science Entrepreneurship and mentioned a combined B.Ed. and B.Sc. in 5 years with courses mapped out for different science teaching specialty. Both are great ideas and will help in increasing student enrollment.</p>	<p>graduating to enroll in medical programs, for example).</p> <p>We agree that a biology degree is great training for a career beyond "a way to prepare for the MCAT". We need to do better in making this case to prospective students.</p> <p>Marine Biology is being reviewed as part of the revamp noted above. It's long-term success is questionable. Despite being a marketing success the cost and lack of local expertise raise concerns.</p> <p>We will work with the FBIT leadership to review and refine the Biology and Business Management program. A focus on entrepreneurship is a logical one considering the opportunities for patents and start-ups in the biological sphere.</p>			
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<p>3.</p>	<p><b>Changes to course requirements:</b></p> <p>Consider making Introductory Ecology or Evolution mandatory for all Biology students regardless of specialization. Both courses provide fundamental knowledge that all Biology graduates should have. This will also boost enrollment in these courses.</p> <p>Remove the requirement for a mandatory Computer Science course so students will have an elective course in 1st year.</p> <p>There is a need to offer an English course at Ontario Tech that is acceptable for Canadian medical schools. There is a literature and writing-based course offered by the Communication Program at Ontario Tech that may be equivalent to an English course, but someone needs to approach and work with the medical schools to make it eligible.</p>	<p>The program streaming and electives will be reviewed as noted above.</p> <p>While an intro computer science course may not be needed, a familiarity with simple coding, data analysis, and analytics is crucial for modern biology whether the student is interested in Ecology and Evolution or Cell/Molecular Biology.</p> <p>The issue around an English Course is an interesting one and we will contact FSSH to see if we can achieve the Medical School application eligibility requirements.</p>	<p>Dean, UPD, and program faculty members</p>	<p>Through the 2025/2026 academic year. Work will begin once exams end with course and program changes submitted over the summer for approval in the fall of 2025.</p>	<p>Support from CIQE related to how to message and path the required changes.</p> <p>Support from the Registrar's Office related to marketing and external communications will be helpful.</p>
<p>4.</p>	<p><b>Increase experiential learning:</b></p> <p>The availability of labs in upper years may not be uniform across the specializations and is lacking for some. Need to ensure that most students have some upper year lab experience as part of their program.</p> <p>A field course should be offered through the Ontario Universities Program in Field Biology (OUPFB), perhaps using OTU's Windfield Farms which appears to be underutilized by the Biological Science program. This will increase field and experiential experience for students in ecology and</p>	<p>This will be examined as part of the review process. We agree that upper-year lab experience is crucial to preparing students for careers in biology. Ideally, some of this experience will be arrived at via the co-op program, but there is also a need for instructional lab experience.</p> <p>We will explore the possibility of offering an urban ecology field course for our students. This would fit with our location and the</p>	<p>Dean, UPD, program faculty members, and Co-op advising team</p>	<p>Through the 2025/2026 academic year. Work will begin once exams end with course and program changes submitted over the summer for approval in the fall of 2025.</p> <p>Student surveys will need to be developed to see why students are not applying for the Co-op program in Biology, and how to improve applications to the</p>	<p>Support from CIQE related to how to message and path the required changes.</p> <p>Support from the Registrar's Office related to marketing and external communications will be helpful.</p> <p>Support from the experiential learning/Co-op team will aid in getting a better lens on what is</p>

	<p>environmental science and open up all the OUPFB courses to OTU students.</p> <p>Increase students' participation and success in COOPs. There appears to be 26 students currently registered in COOP and there are 56 COOP positions posted but so far there is no information of how many students are successful in obtaining a position. There is a need to better track and promote the COOP program and ensure students get positions. Feedback from students who completed a COOP placement about whether they felt they were prepared and if they felt the placement was useful is also needed.</p>	<p>space resources that we have at our disposal on Windfield Farms. Plugging into the OUPFB is a great idea and we will examine how to do that and the associated costs.</p> <p>We need to expand our co-op focus beyond computer science, there seems to be an unequal effort placement currently.</p> <p>As mentioned, we need to do a better job of connecting with all of our students to determine how they see their experience in their program, the Faculty of Science, and Ontario Tech.</p>		<p>positions that may be available.</p>	<p>lacking in the biology program related to student recruitment.</p>
5.	<p><b>Improving student experience:</b></p> <p>Students mentioned that they would like more Biology summer courses for credit recovery and to spread their course load into the summer since several students have part-time jobs during the school year. Human Anatomy and Cell Biology were mentioned by the students as ones they would like offered in the summer as both courses have high enrollments and relatively high fail rates.</p> <p>There is a lack of study and "hang out" areas in the science buildings. A space with couches, microwave, and snack machines exclusively for undergraduate students would be ideal, equipped with large tables and chairs for studying between classes.</p>	<p>We examine course offerings each term to balance student demand and the costs associated with offering the programming. Better advertising might improve student numbers over the summer and make the classes more viable. By extending invitations to graduating high school students who are accepted to Ontario Tech, we may increase enrollment further and provide a head start for interested individuals.</p>	<p>Dean, UPD, Advancement</p>	<p>Summer offerings will be examined for Summer 2025 to see if a better match can be made to student demand.</p> <p>For Summer 2026 we will look to offer "advanced placement" for interested high school students.</p> <p>Long-term projects related to student study space will be tracked with advancement</p>	<p>Support from the Registrar's Office related to marketing and external communications will be helpful.</p>

	<p>Since Ontario Tech is a commuter school, these spaces are invaluable for these students and will help build comradery and engagement. A new fundraising initiative has been launched to finish the 5th floor of Student Centre and to construct a new Teaching Building with large lecture rooms. Perhaps these new infrastructures will relieve some of the space constraints in the current Biology building so there will be a dedicated study/lounge area for undergraduates.</p>	<p>Student study space is a key part of the faculty of science fund raising effort.</p>			
<p>6.</p>	<p><b>Tracking students' satisfaction and success:</b></p> <p>The absence of exit surveys, student evaluations of specializations, and other program-specific assessments limits the ability to track student satisfaction and success effectively. Exit surveys provide valuable feedback on students' overall experiences, including teaching quality, course relevance, and support services.</p> <p>Similarly, evaluations of specific specializations help assess how well different areas of the curriculum meet students' needs and expectations. Without these data, it is difficult to identify strengths or areas for improvement.</p> <p>To address this, the program should implement regular exit surveys and specialization evaluations to gather critical feedback. This information should then be used to inform curriculum updates, faculty development, and overall program improvements. Tracking student satisfaction and success through these tools is essential for the program's ongoing development and responsiveness to student needs.</p>	<p>While some effort is put into tracking student outcomes, this is an area where we need to improve. Knowing where our students are going will help improve our marketing and recruitment efforts. It will also allow us to ensure we are adequately preparing our graduates for the workforce.</p> <p>Better tracking of alumni will help improve our fundraising efforts both via better contact, but also by providing more targeted opportunities for them to give back to the university and Faculty of Science, in particular.</p>	<p>Dean, Alumni Relations</p>	<p>2025/26 we will work to develop an exit survey for recent graduates. Connections with Alumni Relations to send the surveys will be needed. It would be a great time to develop a series of surveys to probe the opinions and relationships between more distant alumni and the Faculty of Science. For example, 1, 5 and 10 year graduates.</p> <p>Our proposed co-op student/work-study student will initiate this work in the summer of 2025.</p>	<p>Support from Alumni Relations will be needed to contact the past graduates, develop the surveys, and ensure that they will be valid tools.</p>

\*The Dean shall be responsible for monitoring and reporting on the Implementation Plan.

**Recommendations not Addressed and Rationale**

#	Recommendation not Addressed	Rationale
	n/a	

**Due Date for 18-Month Follow-up Report:** September 1, 2026

**Date of Next Cyclical Review:** 2030-2032