Program Review: One-Year Follow-Up Report
Math-Science (except Engineering)

Faculty Name	Math Science Department (all disciplines except Engineering)
Date Submitted	February 10, 2025
Submitted by	Sandra Milligan and Aisling Brady, Biology Instructors

A. Overview

Overall, the Math-Science program has made tremendous strides in the past year to meet new College goals. In June 2023, the department completed our first Final Report and developed a detailed Action Plan with over 40 short- and long-term goals. At the same time, the College underwent its first Quality Assurance Process Audit (QAPA). The outcome of that audit greatly changed the priorities for all College members. Our Action Plan was put on hold in Feb. 2024 so that our department members could complete new "Foundational Action Items" to build structure for our department. These actions included: developing a Vision, Mission, and Values Statements, writing Program Learning Outcomes, and completing Curriculum Mapping. As of December 2024, these tasks are complete. This One-Year Report and its new Action Plan incorporate our learning from the Program Review process, information from the QAPA report, responsive actions to a dynamic post-secondary education environment, and a better understanding of the scope of our department goals, which must be obtainable with minimal changes to the budget. The goals in our Final Report and in this One-Year Report remain evidence-based, with student and community success as our unifying goal and passion. Please see Appendix II and III for Department Vision, Mission, and Program Learning Outcomes for all programs.

This report includes the Associate of Science, Island Pre-Health Science Advanced Diploma, and the Island Pre-Health Science Associate of Science. As of February 2025, when this report was finalized the Health Science Diploma program is approved with a goal to start in September 2025, which will be available to International Students. Creation of an Associate of Science with a Computer Science emphasis is also in progress. These latter two programs did not exist when the Final Report and this report were written but will be included in future program reviews.

External Review – Biology and Chemistry and Math - Physics and Computer Science

In the Spring of 2022 External Reviewers provided twelve recommendations based on the Biology-Chemistry Self-Study and the Math-Physics and Computer Science Self Study. We responded to these recommendations in our Final Report and acted on them. Of the twelve recommendations, six were considered outside the scope of department program review or were rejected by the Dean at this time (#1, 3, 5-8), five have been completed (#4, 9-12), and one is ongoing (#2 Create two-year and 1-year certificate programs).

B. Impacts on Program Structures

Since receipt of the Dean's feedback on the Math-Science Department Final Reports in November 2023, the department completed Foundational Action Items to build the framework upon which to develop our programs with a cohesive, evidence-based approach. Specifically, in chronological order we have:

- Developed spreadsheets to track progress on Action Plan goals (December 2023)
- Developed Department Mission, Vision, and Values statements (April 2024)
- Developed Program Learning Outcomes for the Associate of Science degree, Island Pre-Health Science Advanced Diploma and Island Pre-Health Science Associate of Science degree (April 2024)
- Completed Curriculum Mapping for all courses in the department (Dec. 2024)

From this foundation, future actions relevant to Program Structures include:

- Analyze the program curriculum map to determine strengths and gaps in coverage of Program Learning Outcomes and determined changes that can be made to curriculum to address the gaps. (Jan – April 2025)
- Update learning outcomes on courses that have not been updated within the last two years, with a goal to link them more closely to Program Learning Outcomes (2025 – 2026)
- Create a Program Advisory Committee Terms of Reference, recruit members and commence meetings (on hold until new college policy is developed, and direction from the Dean's office is provided)

C. Impacts on Teaching and Learning Practices

Professional Development Planning and Reporting

The Math-Science department has a culture of continual improvement of our skills and knowledge to promote high quality teaching. Most faculty regularly participate in professional development (PD) activities to learn and then implement their learning. The department has had annual "PD sharing" events for the past few years. However, structures did not exist to support consistent PD planning and reporting. Starting in September of 2024, a new PD Plan was provided by the Dean's office. This tool encouraged development of department-wide PD goals for the first time, to unite faculty in the department around a small number of activities, in addition to their personal PD goals.

Survey of Faculty PD Activities

In December 2024, the department delivered an anonymous survey of our faculty to gain quantitative evidence to describe current engagement in PD activities and participation in End of Course Surveys. Participation was high with completion by 16 out of 18 faculty members who were hired within the department at the time. Key findings from this survey demonstrate:

- 60% of our faculty annually attend 4 or more PD events put on by our Centre for Teaching, Learning and Innovation (CTLI)
- 33% of our faculty have attended some PD events put on by CTLI, at least once
- 67% of our faculty's dominant PD activities relate to teaching and learning, with the same percentage having implemented changes in our courses because of these PD activities
- 67% of our faculty dedicate at least some portion of their PD time towards staying current in their content area over the past year, while 13% prioritized their PD time in this area

Department specific PD

A college-wide and department PD goal for 2024-25 is to address the use of AI tools in teaching, learning and assessment. Aspects of AI that faculty are encouraged to learn about include:

- How can faculty use these tools to help them in their work
- How can faculty incorporate the use of AI tools to teach students how to use them
- How will faculty address the use of AI tools by students in the course assignments

While the Centre for Teaching, Learning and Innovation (CTLI) has resources available, the department has organized a workshop to share our collective knowledge on these AI topics and brainstorm how to implement changes to curriculum to increase instructor and student proficiency with these tools (May 2025). Several department faculty members have participated in CTLI's 'Assessment in the Age of Artificial Intelligence' PD sessions, as well as the 'NIC GenAI Exploration Group' learning community.

Course Surveys of Student Feedback

While many instructors have been soliciting student feedback for years, CTLI standardized an End-of-Course survey, relating to students' experience of course content and delivery, beginning in the 2023-24 academic year. Mid-course surveys became available in 2024-25. Most Math-Science instructors opted in to the standardized End-of-course surveys. An anonymous poll was conducted in November 2024 to determine our department's level of participation in this voluntary program. The findings were as follows:

- Fall 2023 – 62.5% (19% were on leave or not teaching)
- Winter 2024 – 75% (12.5% were on leave or not teaching)
- Fall 2024 – 81% (6% were on leave or not teaching)

Challenges occurred around communication of end-of-course feedback surveys' accessibility and availability, such that many courses had fewer than the minimum required number of participants to see reports, but procedures were improved based on feedback to CTLI.

Our faculty have found a variety of benefits from completing these surveys, including the following (percentages reflect the amount of faculty who chose this option, from a multi-select list, when asked what some of the benefits are from participating in course feedback surveys):

- Learning what best supports students (73%)
- Learning that students are variable in their learning and teaching preferences (67%)
- Improving subsequent semesters (67%)
- Confirmation of effective teaching practices (53%)
- Learning about which learning practices are most and least effective (47%)
- Makes me feel good (40%)

Provincial Articulation Committee Participation

Participation of NICs Math-Science faculty in Provincial Articulation Committee meetings allows faculty to ensure curriculum supports a high degree of mobility of BC post-secondary students. Additional benefits include subject-specific teaching and learning opportunities, and collegiality with colleagues at other institutions, which support activities like External Program Reviews.

Faculty from the Math-Science department attend the annual meetings for these Provincial Articulation Committees:

- Biology
- Chemistry
- British Columbia Committee on the Undergraduate Program in Mathematics and Statistics (BCcupms)
- Physics and Astronomy
- Engineering
- Health Educators

D. Impacts on the Student Experience

Program Learning Outcomes (PLOs) and Curriculum Mapping

As a department, not only did we develop mission and vision statements to unite us in a common goal, we also developed program learning outcomes for all programs in our department: Associate of Science degree, Island Pre-Health Science Advanced Diploma and Island Pre-Health Associate of Science. Curriculum mapping to these specific learning outcomes is almost complete as of December 2024. Existing gaps are due to the fact that some of our programs have courses in other departments that have not yet done any curriculum mapping. Curriculum mapping provides detailed information about how our courses ensure students meet our PLOs and identifies gaps where the curriculum does not fully meet PLOs.

The Curriculum Mapping activity demonstrated that our courses meet our PLOs in these areas (refer to Appendix II Mission, Vision and Program Learning Outcomes) (see Figure 1):

- Scientific Explanation
- Solutions to Scientific Problems
- Communication Skills
- Quantitative and Qualitative Reasoning
- Scientific Method (for those courses that include labs). This PLO is addressed at a developing and advanced levels in courses that have labs, and not in courses without labs.
- Laboratory skills (for those courses that include labs)
- Technology and Ethics
- Professional and Ethical Conduct

One PLO is not well met by existing Course Learning Outcomes. Existing gaps where our courses need some work to meet PLOs include:

- Indigenous Perspectives

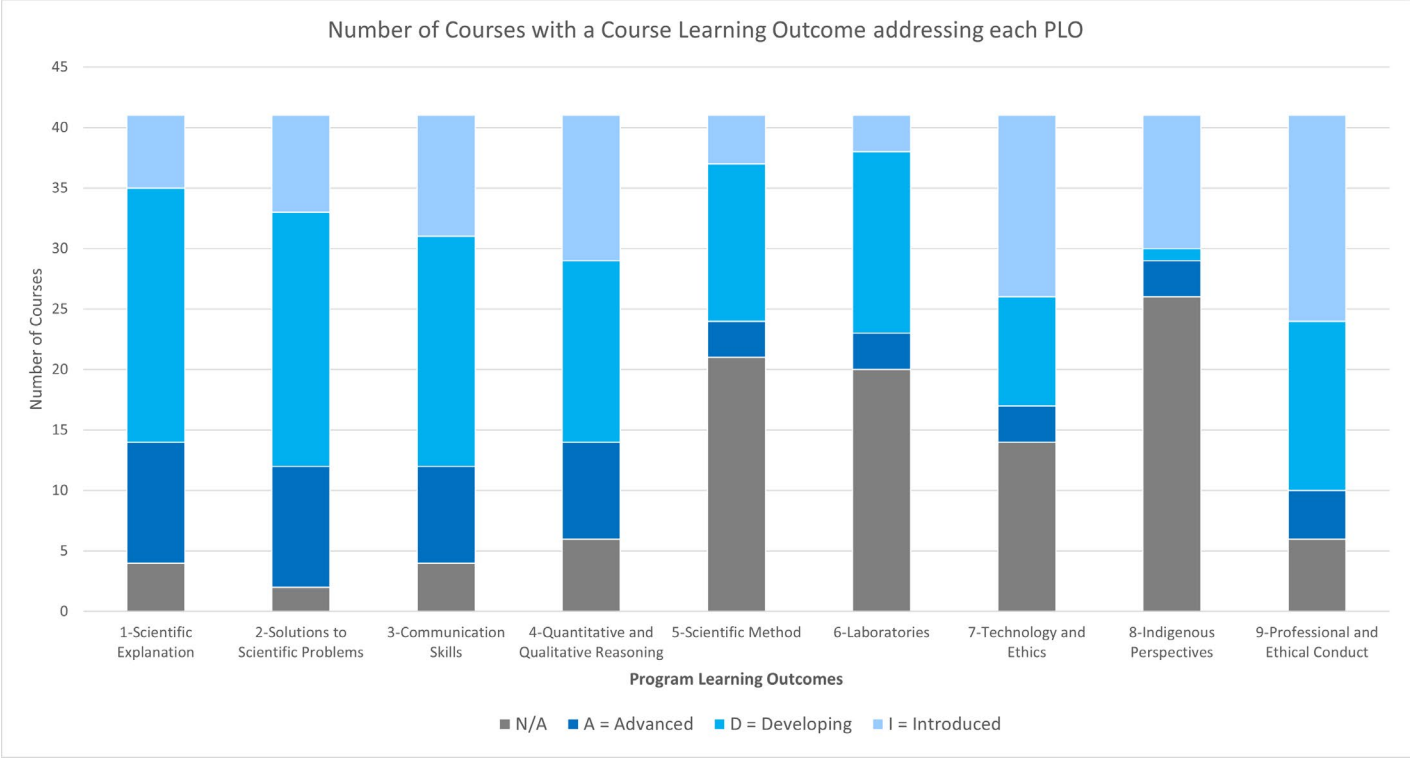

Figure 1: Graph showing the number of courses that have at least one Course Learning Outcome (CLO) that address each PLO. Many courses have more than one CLO that address each PLO. In those cases, the level assigned to the course is the most frequent level of alignment of the CLOs with each PLO. Notes: 1) two of the 41 Math-Science courses were not yet mapped at the time this graph was made. 2) Shortly after the external review phase of this Program Review the Computer Science courses were moved into a different department. As that department has not yet completed their curriculum mapping work on the computer science courses are not included in this data.

The attached Action Plan includes details of how we will continue to improve the curriculum to meet program learning outcomes, including focused PD workshops in May-June 2025 on Technology (GenAI) and Indigenization of Curriculum. Additionally, Course Learning Outcomes are in the process of being updated to better link to PLOs.

PLO Alignment with Professional Requirements

The calculus-based Physics courses have actively aligned their course content to match the core competencies set forth by the Common First Year Engineering Curriculum established by the BCCAT Engineering Articulation Committee. Other content areas within Math-Science have yet to align course content to core competencies from professional associations to reduce content yet ensure transferability.

Three-Year Rolling Roster

The External Review of our Final Report recommended a 2-year schedule of courses, and the Dean recommended a three-year rolling roster produced by the department (November 2023). This would provide certainty for students planning to complete department programs. The Registrar (December 2023) noted this is not currently possible but will facilitate this change once a new website is completed. We were able to post spring and summer intersession courses (Physics 100 and 101) nearly a year in advance, to ensure students registered in Island Pre-Health Science Advanced Diploma had the opportunity to register in these courses earlier and plan academic course loads with more foresight. While a 2- to 3-year advanced schedule of courses has not been created yet, we are hopeful that this will be a priority going forward. The department recommends that senior administration refrain from cancelling low

enrolment courses, to allow for sense of stability by students, and to maintain lab presence at all campuses. In summary, however, establishing a three-year rolling roster is only possible with collaboration of the Dean's office and the Registrar, and is outside the scope of faculty in the department.

New Credentials

Since development of our Final Report (June 2023), the Island Pre-Health Science program (which is an Advanced Diploma, but there is also an Associate of Science degree for students wanting an early exit option at the end of 2-years) commenced in September 2023. A new Health Science diploma was developed in December 2024 and will begin in September 2025. Other new, relevant credentials that are supported in principle by faculty include:

- Foundations of Science Certificate – a one-year certificate for first year science. The courses for this program already exist and this certificate was recommended by the External Reviewers (p15) and supported by the Dean (December 2023)
- Associate of Science in Sustainable Agriculture
- Associate of Science in Environmental Science
- Marine Biology Diploma
- "Biologist in Training" stream, to provide the educational credits required for application to the Registered Professional Biologist (RPBio) designation
- Island Studies Tideline to Treeline: the natural and cultural history of Northern Vancouver Island
- Botany Stream
- Create chemistry courses, in particular second year chemistry courses so the Associate of Science degree in Chemistry could be developed

These options will need to be discussed further, considering changing post-secondary education needs, and programming that matches with national labour market demands.

Labour Market Relevance

The BC Student Outcomes Survey provides input from students one and two years after completing the Arts and Science Associate Degree program. The data posted December 2024 (219 respondents) show that 94% of NIC students are satisfied or very satisfied with their education and 96% said the quality of education was very good, good or adequate. The need for skilled workers in health sciences has never been more evident in the Vancouver Island region. According to the BC Labour Market Outlook 2023-2033, 'Health care and social assistance' will generate 166,300 job openings (17% of total) over the next decade, making it one of the largest growth sectors in the province. Within the Vancouver Island/Coast region specifically, there will be 174,700 job openings, with healthcare being a dominant employment sector.

E. Impacts on Approaches to Indigenization

Progress on Indigenization

The Math-Science department has been proactive to implement recommendations of the Truth and Reconciliation Commission's Call to Action, notably 62ii: *Provide the necessary funding to post-secondary institutions to educate teachers on how to integrate Indigenous knowledge and teaching methods into classrooms.* We acknowledge that actions toward reconciliation require ongoing education of ourselves as Canadians and educators, and ongoing reflection and renewal of our curriculum to continue to Indigenize our classrooms and curriculum. More specifically, we will work towards Indigenization of the curriculum to include the following learning outcome to all courses, as suggested by the Offices of Indigenous Education and Global Engagement:

> By the end of the course the student should be able to apply intercultural and local Indigenous perspectives in meaningful and respectful ways

To meet this goal, we will work toward:

1. Enhancing our own learning of Indigenous perspectives (people, practices and history) with a goal of becoming "cognizant of the nature of social power and oppression to not repeat the horrors of the past[1]." We see this as a personal responsibility as Canadians, to work towards reconciliation. While related, we see this personal education as separate from Indigenization of our curriculum.
2. Exploring and incorporating teaching styles, classroom environments, and assessment methods that more closely align with Indigenous principles of learning.
3. Facilitating students' self-guided learning around Indigenous knowledge and encouraging respectful dialogue and knowledge sharing.

The Math-Science department greatly respects the need to incorporate Indigenous practice and content into our curriculum. To that end, the department held a week-long Group PD event to enhance our knowledge of Indigenous perspectives and the local First Nations in May of 2021. While Indigenization was a high priority at that time, since then other tasks have had higher priority, including program review, developing program structure, responding to the new, mandatory PD planning and reporting requirements, and addressing the use of AI.

As we complete this One-Year Report, our time can now be refocused on efforts towards Indigenization and Interculturalization. We see this as an ongoing process, with actions, but with no "end point". To guide this process, we plan to develop a Department Indigenization Plan, in collaboration with the Working Together Working Group.

Indigenization of Practice

We are guided by First Peoples Principles of Learning as presented by the First Nations Education Steering Committee. Our class sizes are small, allowing us to connect with each one of our students; we know their names and we get to know them and their career and life aspirations. This allows us to implement the principle that "Learning ultimately supports the well-being of the self..." and is relational. We believe these practices meet the needs of ALL learners, not just Indigenous learners. Our End of Course Surveys provide evidence that students feel cared for. Responses to the question "The learning environment was welcoming and supportive" are most numerous in the "agree and strongly agree" category. Comments include statements like "the instructor cares for their students". Relationships between instructors and students often continue beyond the length of the course, with students

[1] https://journals.sagepub.com/doi/10.1177/1177180118785382

connecting years later to share the stories of their career paths Many of our science courses have labs, which allow us to give students the opportunity for “experiential learning”, which is another First People’s principle of learning.

Facilitating Student Learning on Indigenous Knowledge

Many of our courses already include Indigenous content, including information such as First Nations’ use of natural materials, discussion of methods of information dissemination and ways of learning. Much of this content is collected through students’ individual exploration. A detailed list of current Indigenous content and learning activities was created in our Final Report for Bio and Chem (2023). This list will be incorporated into the Department Indigenization Plan.

The workshops provided by the Offices of Global Engagement and Indigenous Education in the Winter 2025 term to help Indigenize Course Learning Outcomes are very welcome and required to help us navigate this process. Some of our faculty are engaging in these workshops and will be able to share that knowledge with the rest in our June 2025 workshop.

The Working Together Working Group is available, and we plan to work with them to receive their insight in guidance to draft the Department Indigenization Plan, and to help us implement changes.

Challenges to Indigenization

The main challenge with broadening the scope of Indigenization of practice and content has been time. As stated earlier, other College priorities for Program Review, Program Structure creation, and addressing AI have taken priority over Indigenization over the past three years. When this report is complete and all faculty are incorporating AI into practice and teaching, we will be able to redirect department attention to broaden Indigenization in courses that are currently lacking. Indigenization is a goal in our department PD plan; specific actions to implement that goal can be found in the attached action plan.

We are challenged by the conflicting values attributed to the use of knowledge by scientific and Indigenous communities. In science, sharing knowledge is a responsibility and requirement. The body of scientific knowledge grows through social interaction and sharing. A principle of Indigenous Learning is that “Learning involves recognizing that some knowledge is sacred and only shared with permission and/or in certain situations,”, which conflicts with the scientific training we have had.

The BC Labour Market Outlook 2023 Edition notes that Indigenous communities “value a wide range of activities that are often not captured by labour market methodologies” (p8) As such, as a department we strive to be flexible to fill education needs identified by NIC’s Indigenous Education department in collaboration with Indigenous communities.

Appendix I: Timeline of events with summary of actions

June 7, 2023	Math-Science Final Action Plan submitted to the Dean. This plan was developed through separate Self-Study Reports by Biology with Chemistry and Math with Physics but were compiled into one Final Action Plan.
Nov. 14, 2023	Dean's feedback on the Final Action Plan received
Nov 16-17, 2023	NIC QAPA panel visit. Our Department Chair attended the whole event, along with two Math-Science faculty acting in their roles as Education Council Chair and Curriculum Committee Chair.
Dec. 13, 2023	Tracking spreadsheets developed to track Action Plan items; no template available from CLTI or the Dean's office at this point.
Dec. 2023	Department meeting where faculty gained clarity on Dean's feedback.
Dec. 18, 2023	QAPA Report received by NIC
Jan. 15, 2024	Department meeting MASC Program Review Meeting Notes - Jan 15 2024.docx. New "Foundational Action Items" were identified and prioritized. These new action items are to take precedence over previous Final Action Plan items. They include Program Learning Outcomes and curriculum mapping, amongst others. Clarification was given that many of our existing action items are outside the scope of Program Review and must be abandoned.
Jan. 30, 2024	Department meeting MASC Program Review Meeting Notes Jan. 30 2024 Working groups established for: Mission, Vision and Values; Program Learning Outcomes; Curriculum Mapping
Feb. 10, 2024	New "Foundational Action Items" Math and Science Foundation Action Items 02 2024.docx document provided by CTLI based on January meetings, which clarifies the new priorities for action items.
April 2024	Department meeting discussion with the Dean on Mission, Vision and Values, and Program Learning Outcomes. While general agreement exists, consensus was not reached and some details (e.g. examples of HIPS practices) need to be added. Will revisit after curriculum mapping
September 2024	GenAI identified by NIC as a priority action item.
October 2024	Curriculum mapping worksheet completed; Dean's Office supported insertion of data into UBC site.
December 2024	Curriculum mapping on the UBC site has been completed for over 90% of Math-Science courses. Session with Center for Teaching and Learning assisted in identifying gaps in linkages between Program Learning Outcomes and Curriculum but also identified limitations of the software and the need to confirm whether apparent gaps are supported by the data. A draft of this One-Year Report was provided to the department for review and input, with the goal of submission at the end of January 2025.

Appendix II – Math-Science Department Vision, Goals, Mission Statement and Values

Vision Statement:

We continuously strive to enhance our delivery of high quality and accessible educational experiences in mathematics, science and engineering in a supportive and student-centered environment.

We aim to achieve this by:

1. using innovative and evidence-based teaching practices;
2. applying authentic formative and summative assessments that provide students with agency, choice and autonomy;
3. continuing and striving to incorporate high impact practices;
4. weaving Indigenous knowledge and intercultural connections throughout our programming and curricula; and
5. assuring broad academic transfer opportunities across all our disciplines in BC and beyond.

Departmental Goals:

Over the next 5 years, we aim to do the following:

1. Complete an inventory of quality and evidence-based teaching and assessment practices in mathematics, science and engineering.
2. Identify course redesign and assessment redesign
3. Organize ongoing department professional development
4. Develop concept forms for offering comprehensive one- and two-year post-secondary programs in math, physics, chemistry, and engineering
5. Adopt teaching practices that support student-centered and engaged learning and add authentic formative and summative assessment options to all courses
6. Develop a departmental Indigenization Plan

Mission Statement:

The Math-Science Department is dedicated to fostering student success by igniting a passion for discovery and achieving academic excellence in mathematics, science, and engineering. We cultivate critical thinking, problem-solving, and adaptability, empowering students to excel in future studies and make meaningful contributions in an ever-changing world.

Department Values:

- **Student success:** We are passionate about the success of each student and take a personal interest in discovering what motivates and excites each student
- **Diversity:** We embrace the diversity of our students and strive to provide inclusive educational opportunities to support all students
- **Appreciate People, Land and Culture:** We believe in fostering a spirit of collaboration and respect in our interactions with one another, our students, our community, and our environment.
- **Authentic Learning:** We value relevant learning experiences that can be applied broadly for future success
- **Commitment to quality:** We value continuous improvement in the design of our courses and aim to deliver quality learning experiences, which includes staying current in our disciplines and teaching practice.
- **Collegial and collaborative department**: We value our colleague's knowledge, our culture of excellence, and support each other to maintain and enhance excellence in teaching.

Appendix III – Program Learning Outcomes for Associate of Science Degree and the Island Pre-Health Science Program

Associate of Science Degree:

Upon successful completion of this program, students should be able to:

1. explain terms, concepts and theories in the sciences;
2. analyze, synthesize and integrate knowledge to solve problems in the sciences;
3. read, write, and communicate effectively across many disciplines;
4. evaluate scientific literature, data, and news with quantitative and qualitative reasoning and critical thinking skills;
5. apply the scientific method to various activities in lab and class;
6. complete laboratory activities by following guidelines, processes, procedures and protocols;
7. evaluate and implement technology in an ethical and appropriate manner;
8. apply intercultural and local Indigenous perspectives in meaningful and respectful ways;
9. conduct themselves in a professional and ethical manner when working individually or as part of a team.

Island Pre-Health Science Advanced Diploma:

Upon successful completion of this program, students should be able to:

1. explain terms, concepts, and theories related to the health science field;
2. apply principles of human form and function to healthy and diseased states;
3. acknowledge how colonization and other historical practices have impacted Indigenous communities, particularly as it relates to health and wellness;
4. apply Indigenous cultural practices across many disciplines related to health sciences;
5. examine moral and ethical considerations as they relate to health science and other disciplines;
6. apply the basic concepts, methods, and tools of public health data collection, use, and analysis;
7. problem solve issues and situations related to health sciences by employing critical thinking skills;
8. collaborate effectively with peers, instructors, and community members;
9. communicate effectively in various formats with colleagues, faculty, and community members;
10. apply emerging quantitative reasoning skills to topics and issues related to health science;
11. apply research skills commonly used in the field of health science;
12. conduct themselves professionally and ethically in an academic environment.

Island Pre-Health Science Associate of Science Degree:

Students in the Island Pre-Health Science program who complete only two years of the program will be awarded an Associate of Science degree in Island Pre-Health Sciences. The PLOs are as follows:

Upon successful completion of this program, students should be able to:

1. apply the scientific method to various activities in lab and class;
2. read, write, and communicate effectively across many disciplines related to health sciences;
3. complete laboratory activities by following guidelines, processes, procedures and protocols;
4. evaluate scientific literature, data, and news with quantitative and qualitative reasoning and critical thinking skills;
5. explain terms, concepts and theories in biology and health science needed to progress to upper level university courses within biological life sciences and/or health sciences;
6. examine health science through an Indigenous lens;
7. describe regional-specific issues and career options in health science;
8. demonstrate professional work habits and ethical conduct when working individually or as part of a team.

F. Completed Action Items

#	Desired Outcome	Completed Actions	Challenges, Successes, and Impacts
	What did you want to achieve?	*What actions have been taken to achieve the desired outcome?*	*What challenges have you encountered, what successes have the change brought, and/or what impacts have the changes had on the student's learning experience?*
1	**Develop Vision, Mission, Values statements**	Vision, Mission, Values statements were completed April 2024	Completed April 2024, though not finalized as the Dean suggested some changes. Recommendation to return to these items after curriculum mapping is complete.
2	**Develop Program Learning Outcomes**	Program learning outcomes complete for Associate of Science, Island Pre-Health Associate of Science, Island Pre-Health Science Advanced Diploma	Completed April 2024
3	**Develop Tracking Methods for Action Item Progress**	Spreadsheets for most ongoing action items (e.g. evidence of student success, student-community engagement, end of course surveys, high impact practices) have been prepared and are available to all math-science faculty on SharePoint to document	Tracking allows all faculty in the department to be aware of each other's actions and efforts to build the program, which supports a culture of excellence. The Action Plan developed for the Final Report was detailed and included many existing department activities that meet many goals but are not tracked systematically in any way. These include evidence of student learning, ways in which community is brought into the classroom and students into the community, and climate change practices amongst others. Input from the Dean's office was to limit the number of Action Plan goals, but that would mean losing the visibility of these actions. They have been included in this one-year report, though the format of the one-year report necessitates a new numbering system for these action items.
4	**Complete Curriculum Mapping**	Curriculum mapping has been complete (Dec. 2024) for over 90% of our courses and all three programs. The department spent two hours with Liesel Knaack to analysis the data Dec. 10, 2024. Of nine PLOs, four have excellent coverage, and three show gaps, namely Technology and Ethics, Indigenous Perspectives, and Professional and Ethical Conduct. Specific Action Plan items are listed below to meet those gaps.	The Curriculum Mapping to PLOs will be revisited as part of annual department-wide meetings at which we examine the One-Year Report Action Plan and set short-term collective department goals. As more course learning outcomes are updated to better align with PLOs, the output of the curriculum mapping is expected to show continual improvement in alignment of PLOs with curriculum.
5	**Update Course Learning Outcomes**	Courses that have been updated since 2023 include: Bio 060/110, 203, 211, 260, 261, 301, 350; IPH 101, 102, 201, 202, 310, 350; Che 060, 110, 200; Mat 181, 182, 190 PHY 050, 060, 120, 121 STA 115	Course curriculum better aligns with program learning outcomes, implements current research on teaching practice, and provides more diverse assessment practices.

#	Desired Outcome	Completed Actions	Challenges, Successes, and Impacts
		SSA 100, 101 ENR 100, 101	
6	**Maintain Communication between Department and Advising**	To meet External Reviewers recommendation #10, the Math-Science department now has a dedicated program coordinator with the Island Pre-Health Science program that ensures consistent communication with educational advisors. The department chair also connects regularly with educational advisors.	Students are provided with current and detailed information about how NIC programs and courses meet their educational goals and prepare them for the labour market.
7	**Produce a student planning tool that outlines pathways to various programs**	To meet External Reviewers recommendation #11, multiple pathways documents have been developed for the Island Pre-Health Science program students and new Health Science diploma program.	
8	**Increase the linkage between Professional Development activities and department-wide and College-wide goals**	In May 2024 the department developed department PD goals for the first time. Faculty were encouraged to include these department PD goals in their personal PD plans and to engage in PD activities to meet those goals. Two specific goals include Indigenization of the curriculum and address use of GenAI tools by us and by our students.	Faculty will participate in GenAI workshops in May and June 2025 to share existing practice and support everyone in their learning. Course Learning Outcomes will be updated to include Technology (GenAI tools) and Indigenous Perspectives. Challenges with Indigenization are outlined above in Section E on Indigenization.

G. Plans to Complete Remaining Action Items

This Action Plan will be reviewed annually each Spring to ensure regular monitoring, update action items, and refresh as needed to respond to changes in post-secondary education.

#	Desired Outcome	Actions	Updates	Person(s)	End Date	Resources	Monitoring	Results
	What do you want to achieve?	*What actions will be or are already in progress to achieve the desired outcome?*	*What actions have already begun? What changes or edits have happened? What are your next steps?*	*Who will be responsible for leading?*	*Month/year*	*What resources will be required to complete this action?*	*How will you track the implementation of your action?*	*How will you know that you have achieved your desired outcome?*
1. Commitment to Learners *This area focuses on the program's commitment to student learning by reflecting on the underlying values and philosophy of the program. This includes the alignment of program commitments with the needs and expectations of students, the institution and the broader discipline, industry, or profession.*								
1.1	**Develop and implement a Department Indigenization Plan for the program and courses**	1. Have a Department Workshop in June 2025 to discuss how to Indigenize Course Learning Outcomes (e.g. one course at a time or department wide practices?) and begin the work to Indigenize CLOs. 2. Meet with the Working Together Group to discuss and develop department Indigenization plan. 3. Develop a Department Indigenization Plan 4. Develop a tracking method to record Indigenization practice and content in collaboration with the Dean's office. 5. Add the new Indigenization and Internationalization Course Learning Outcome to courses as practices are developed.	Faculty are encouraged to: Participate in workshops provided by Office of Indigenous Education and Global Engagement on Indigenization of Course Learning Outcomes in the Winter 2025 term June 2025 workshop is scheduled to discuss Indigenization of Course Learning Outcomes and to develop the Department Indigenization Plan in collaboration with the Working Together Group	Sandra Milligan	Dec. 2025 to draft a Department Indigenization Plan. Ongoing to add the new CLO to course curriculum.	CLTI Resources Working Together Working Group consultation Subject specific resources from Articulation Committee	Our Action Plan will be reviewed and updated annually	All Course Learning Outcomes will include Indigenization. As instructors, we will know more about our local First Nations and that aspect of Canadian History, we will know how to facilitate Indigenous and intercultural learning, and we will support sharing of content in our classes that relates to local First Nations (where it is appropriate to share).

#	Desired Outcome	Actions	Updates	Person(s)	End Date	Resources	Monitoring	Results

2. Program Structures

This area focuses on the roots and design of the program, as well as how and why the program has evolved over time highlighting key milestones, developments, and accomplishments as it relates to the student learning experience. This includes the evolution itself, as well as the mechanisms in place for identifying and responding to emerging needs and changing realities.

2.1	**Improve alignment of program learning outcomes to curriculum**	1. Continue to update remaining Course Learning Outcomes to better reflect Program Learning Outcomes and diversify assessment formats. 2. Create document to guide Math-Science instructors on CLO updating, so that Math-Science PLOs are included appropriately, and consistent with other Math-Science courses. 3. Create an internal document that provides more information to instructors for the purpose of updating curriculum mapping using the UBC tool so that assessments (e.g. exam, vs midterm, final exam), and other terms (technology) are clearer.	In 2025, courses for which learning outcomes will be revised include: Bio 103, 102, 200, 215, 230; Che 051, 060, 111, 201 Mat 102, 122, 133, 151 Phys 100, 101, 170, 216 In 2026, courses for which learning outcomes will be revised include: Bio 111, 160, 161, 201 MAT 162, 163, 210, and 214 PHY 215	Aisling Brady and Jennifer Fallis-Starhunter	August 2026	CTLI	The Curriculum Mapping to PLOs will be revisited as part of annual department-wide meetings at which we examine the One-Year Report Action Plan and set short-term collective department goals.	The department has evidence that demonstrates how our courses meet our Program Learning Outcomes.

#	Desired Outcome	Actions	Updates	Person(s)	End Date	Resources	Monitoring	Results
3. Learning Community *This area focuses on the program as a learning community. This includes interactions and relationships between and among faculty and students within the program, as well as engagement with broader communities (e.g., institutional, regional, discipline, industry, or profession-specific relationships).*								
3.1	**Create a Program Advisory Committee**	Once policy has been developed by senior administrators, recruit members for a PAC, develop Terms of Reference and commence regular meetings	We have put this item on hold until more direction is provided from college policy (to be created) and the Dean's office.	Alex Blair	End Date here	Dean's office	Monitoring details here	Results here
3.2	**Explore Work-Integrated Learning Courses and Opportunities**	1. Add science-focused employers to career fairs. 2. Invite Career Services staff to a department meeting to learn about actions needed to develop a work-integrated learning component to a program. 3. Explore the addition of co-op or practicum course offerings to existing programming.	Learned that Co-op could be added to Associate of Science programs, between Year 1 and 2 and that internships are more appropriate for 1-year credentials. Next steps to discuss with Dean's office	Sandra Milligan	2025	Collaboration with the Dean's office required as no one person has the work of supporting Work-Integrated Learning.	Monitoring details here	Results here
3.3	**Climate Change**	1. Continue to track learning activities that address climate change. 2. As a department, operational activities are carried out to reduce waste and enhance sustainability.	Lab technicians have bee revising practices to eliminate single use materials, when possible, to reduce water use (new vacuum pumps). Faculty events are organized to reduce and divert waste.	Lab technicians, Alex Blair	Ongoing	Facilities department	Annual report updates	
4. Practices								

#	Desired Outcome	Actions	Updates	Person(s)	End Date	Resources	Monitoring	Results
This area focuses on teaching and learning practices, including assessment and evaluation methods and the alignment of these approaches to supportive practices. This includes the methods or approaches members of the department engage in to fulfil the stated commitments while engaging in reflective practice.								
4.1	**Outline and create repository of existing departmental High Impact Practices (HIPs)**	4. Develop a tracking tool to document Bio 250 and IPH 350 Student Research Projects and other HIPs currently occurring in our courses. 5. Develop template assignments for Bio 250 6. Document all existing HIPS practices in a tracking tool to be developed with support from the Dean's office	The spreadsheet has been completed, and math-science faculty are asked to add information related to HIPs, as an ongoing process.	Aisling Brady	Ongoing	CTLI Teach Anywhere website	Create an Excel Spreadsheet on SharePoint with one-pagers for each course.	A repository of what has been completed by our program areas will be evident. Gaps in HIPs can be explored to further enhance our offerings.
4.2	**Develop new High Impact Practices**	7. In collaboration with the Dean's office, develop a checklist for instructors that covers the documentation requirements for taking students off campus for field trips. E.g. waivers, driving arrangements, expense submission. 8. Clarify the budget available to support HIPs.	Associate Dean was asked for support in this area in Dec. 2024	Alex Blair	Depends on Dean's office	Dean's office	Annual Action Plan updates at April department meetings	We will have a checklist of actions of actions required for faculty who want to take students off campus for HIPS activities, with supporting documents and policy prepared in collaboration with the Dean's office.
4.3	**Increase the number of courses for which the End of Course Survey is implemented**	9. Developed a survey tool to collect evidence of # of instructors and courses that use the End of Course Survey 10. Shared survey results with faculty	A faculty survey was delivered December 2024. Results show that 81% of math-science faculty are using the survey.	Aisling Brady	ongoing	CTLI	Could repeat the survey in Dec. 2025	Data and transparency of how many faculty are participating and creating a culture around receiving feedback from students. Allows faculty to continually reflect on

#	Desired Outcome	Actions	Updates	Person(s)	End Date	Resources	Monitoring	Results
								their teaching practices and improve their courses regularly.
4.4	**Increase the linkage between Professional Development activities and department-wide and College-wide goals**	11. Increase the # of faculty accessing Professional Development funding 12. Work together to Indigenize the curriculum 13. Work together to educate ourselves about GenAI tools and how they can be used by us, by our students, and how to update assignments to reflect the use of AI.	1. Faculty survey showed high level of participation 2. Workshop planned for June 2025 to develop Department Indigenization plan. 3. The department will have sharing events for people to describe how they are using AI relative to their work, how they are helping students use AI and how they are addressing the use of AI in assignments.	Aisling Brady – survey Sandra Milligan - GenAI	ongoing	CTLI	Survey could be repeated to monitor trends	Detailed results are included in Section C above.
5. Collective Impact *This area focuses on the accomplishments and contributions of faculty and students from the program. This includes learning experiences, opportunities and outcomes related to the program. This also includes mechanisms in place to help faculty and students reflect upon and recognize accomplishments.*								
5.1	**Develop a Research Sharing event**	Develop a regular (e.g., annual) research sharing event showcasing student and faculty research to the NIC community and the broader community.	Planning underway for winter/spring 2026.	Sarai Racey	ongoing	Dean's office support	Event feedback survey.	Enhanced visibility of NIC student and faculty community research.
5.2	**Student success recognition**	Continue offering a math-science awards tea recognizing students' academic accomplishments	This event is held every May.	Alex Blair	ongoing, annual event	Printing support, financial resources for catering.	Annual event	Students can see their role in their program and feel appreciated for their work.
5.3	**Community contributions**	Continue to be the lead in organizing Annual Math Contest for High School	These events have been occurring for over 10 years, with some gaps during Covid.	Alex Blair, Natalie Ward, Michael Willers	Ongoing annual events	Financial support from Dean's office for	Positive feedback from students and the community at large	Enhanced visibility of NIC programs to

#	Desired Outcome	Actions	Updates	Person(s)	End Date	Resources	Monitoring	Results
		Students, and the Community Science Celebration				Community Science Celebration and the Math Contest Financial and staff support from Community Engagement Team for Com. Science Celebration		improve student and employee recruitment