



PROVIDENCE

ASSESSMENT REPORT FOR BACHELOR OF SCIENCE (BSc)

The Providence science program is Christ-centered, interdisciplinary, and sustainable. It is committed to pedagogical innovation, creation care, truth and reconciliation, community connections, and campus initiatives. This program includes a 3-year BSc General Biology, 4-year BSc Health Science, and 4-year BSc Environmental Science. Students develop an in-depth understanding of various scientific disciplines and scientific methods. They think creatively as they complete diverse course assignments, and think critically as they discuss the past, present, and future of science.

Program Goals	Measurement Means	Benchmarks for Success	Results	Implications
UNDERSTANDING & APPLICATION Recognize and identify the vast biodiversity on our planet. Describe the complexities of fields such as biology, chemistry, earth and environmental science, and health science. Apply scientific knowledge to global issues and everyday decisions related to life, health, and the environment. Supports Goal 2 and 6	DIRECT: final grade in a capstone "Topics" course.	DIRECT: 80% of students earn 80% or higher in a capstone "Topics" course.	Benchmark for success ACHIEVED.	See comments below.
	INDIRECT: course evaluations, participation in science club, attendance at public scholarship events.	INDIRECT: course evaluations, participation in science club, attendance at public scholarship events.	Benchmark for success ACHIEVED.	
METHODS & SKILLS Perform a range of experimental techniques and demonstrate safe laboratory and field practices. Supports Goals 5 and 6	DIRECT: final grade in a "Methods" course.	DIRECT: Completion of lab safety course, and 80% of students earn 80% or more in a "Methods" course.	Benchmark for success ACHIEVED.	
	INDIRECT: incident reports.	INDIRECT: 100% accuracy and completion rates of incident reports.	Benchmark for success ACHIEVED.	
COMMUNICATION Summarize, analyze, critique, write, and present scientific research. Demonstrate the ability to effectively communicate with fellow scientists and the general public. Supports Goal 4	DIRECT: grade on a paper, project, or presentation in a 2nd year science course.	DIRECT: 80% of students earn 80% or higher in any paper, project, or presentation in a 2nd year science course (any 235.2X or 236.2X or 232.2X course).	Benchmark for success ACHIEVED.	
	INDIRECT: contributions to Providence public media.	INDIRECT: contributions to Providence public media (website, social media, app).	Benchmark for success ACHIEVED.	

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Program Goals	Measurement Means	Benchmarks for Success	Results	Implications
CAREER READY Prepare for a career in science or further studies. Supports Goal 5 and 6	DIRECT: science student graduation rate.	DIRECT: 90% of science students committed to graduate, do so.	Benchmark for success ACHIEVED.	See comments below.
	INDIRECT: alumni survey.	INDIRECT: alumni survey	Benchmark for success ACHIEVED.	

IMPLICATIONS

Program Goal 1: Understanding & Application

- In the capstone, fourth-year course Topics in Health Research, all 4/4 students earned a final grade of 80% or greater. In future years, this course will rotate with Topics in Environmental Research, and the grades in that course will also be considered in this report.
- Course evaluations were positive and constructive. A science club is set to begin September 2023, and there is significant interest from students. Several science students attended a science & faith public lecture given by Dr. Joshua Swamidass. Unfortunately, no science students attended the fall 2022 Prov Talks (annual presentations given by Providence faculty and staff that highlight their research interests).

Program Goal 2: Methods and Skills

- All science students are required to complete a lab safety course in Populi each year prior to their first wet lab. In the past academic year, all students that were enrolled in a course with a wet lab successfully completed this course; no students were missed. In the third-year course 235.35 Field Methods, delivered Fall of 2022, 7/7 students earned a final grade of 80% or greater. This course rotates with Molecular Methods, which when it was last taught (winter 2022), 13/13 students earned a final grade of 80% or greater.
- No incidents occurred in the past academic year, and thus no forms were needed.

Program Goal 3: Communication

- In the second-year course 235.25 Scientific Writing and Communication, delivered winter 2023, 5/8 students earned 80% or higher on the review article, and 4/8 earned 80% or higher on the research article. 2/8 students earned 80% or higher on their one slide scientist presentation, and 5/8 students earned 80% or higher on their science book TED-style presentation. Thus, their paper and presentation grades did not achieve the benchmark for success. However, paper and presentation grades in other second-year

courses were better. In the second-year course 235.23 Genetics, 6/6 students earned 80% or higher on their presentation. In the second-year course 236.23 Biochemistry II, 6/6 students earned 80% or higher on their creative project which included written and presentation components. In future, we may wish to keep the direct measurements and benchmarks for success broad as they are now, or we may wish to make them more specific and restrict it to the final grades of just Scientific Writing and Communication (once we edit the science degree requirements to ensure that every science student takes this course).

- Several science students contributed to the Prov App over the course of the past academic year. Near the beginning of the pandemic, then student council president and science student Waedon Dueck contributed to an article on the Prov webpage about the campus vaccination policy.

Program Goal 4: Career Ready

- 100% of the science students that intended to graduate after their second year of studies did so. This statistic excludes the science students that only intended to attend Providence for 1-2 years and then transfer to a different program elsewhere. Since the Providence science program is small, it cannot satisfy all the interests and career needs of students. Some students have transferred because they want a major we do not offer. Others transferred because they want courses that we do not offer. Others transferred because they wanted to pursue a program with co-op and honours, which we do not offer.
 - One recent graduate (Alexandria Buhler, class of 2023) gained summer employment with the local watershed district (in Manitoba watershed districts are responsible for provincial land and water conservation). Another recent graduate (Abby Wiebe, class of 2023) was accepted into the Red River College medical science laboratory program.
- The science students (n=3) that completed the latest alumni survey last year made positive comments. They greatly expanded their knowledge of and appreciation for science, and they enjoyed their time at Providence. Some are working in their field of study. Overall, feedback was positive.

RECOMMENDATIONS

The writers of this report (science professors at Providence) make the following recommendations to ensure the continued growth and success of the science program, and to ensure the preparedness of our graduates.

1. **Hire an internship/practicum coordinator.** This person could coordinate all the internships and other work opportunities across various academic programs at Providence (similar to how the field education coordinator organizes all the field

education opportunities). The science program does not yet have internships due to the lack of administrative support in this area. The current professors have full (and usually excessive) teaching loads and an already full docket of administrative and committee duties.

2. **Offer introductory physics.** This course is a prerequisite for professional programs including optometry, dentistry, and veterinary medicine. Addressing this recommendation would involve hiring a sessional instructor with this expertise and designating a room on campus for physics labs.
3. **Offer an honours degree.** An honours degree is required for entry into many master's programs offered by Canadian universities (e.g. M.Sc. Earth Science at University of Manitoba). In the past, students have left Providence, or not even considered us at all, given our lack of honours degrees in the sciences. There are two main obstacles preventing us from proposing honours degrees: lack of faculty time, and lack of space in 4-year degrees. To further explain the second point, there is not enough room to add in the extra courses and honours thesis to our 4-year degrees, unless we reassess how we categorize and allocate our degree requirements in Biblical and theological, general Arts & Sciences, and professional studies.
4. **Build a second science lab.** There is currently only one teaching lab on campus. The second lab is small, has limited seating, and is used for storage and prep work. The current teaching lab is in use almost every day. Most labs alternate to ensure that all can fit into the semester schedule. Ideally, a second laboratory would be built to accommodate chemistry best. The new lab would have six fume hoods; the current teaching lab has only one. The new lab would also have more room for chemical and glassware storage; the current teaching lab has exhausted all its room for chemical and glassware storage. It is feasible to incorporate this initiative into the upcoming strategic plan and future capital campaigns.

CONCLUSION

In summary, the Providence science program are meeting their benchmarks for success. The science program has grown to include three majors: general biology, health science, and environmental science. These options meet the needs of most prospective science students. The body of science students and science graduates is growing, and time will tell how these students fair in professional programs and in the workplace. Early signs indicate that our graduates have gained entry into competitive professional programs (including pharmacy, rehabilitation sciences, nursing, medical laboratory science, veterinary medicine, and more) and gained employment in their field (including as a health clinic clerk, watershed district worker, and more). To ensure the continued growth and success of the science program, additional resources are necessary.

SENATE PROGRAM REVIEW COMMITTEE REPORT TO THE SENATE

Committee: Angelle Arinobu, Christopher Lortie, Janice Priess, Jeff Anderson

Program Reviewed: Bachelor of Science (BSc)

Introductory Comments:

The report submitted follows the first two programs (TESOL & Communications and Media) in the new format and should serve as another strong example to other programs within PUCTS. It is noted that the program includes a variety of opportunities for students including a 3-year BSc General Biology, 4-year BSc Health Science, and 4-year BSc Environmental Science.

Committee Observations:

The interest and marketability of this degree is clearly seen in the way benchmarks are achieved across the board. Regarding “Career Ready” the benchmark is set at 90% of science students committed to graduate, do so. The capstone course focus and marks earned by students in that course illustrate the commitment to the degree on the part of student and faculty.

It is noted that some students transferred out due to desiring another major in the science field. We concur with two of the recommendations in this regard: 1) Further investment into the program and staffing; 2) Expand course offerings and degrees.

The report includes experiences of graduates being accepted into work and further study that were not likely prior to this degree being offered. Due to the care with which the program has been crafted and the commitment of the faculty we anticipate hearing an increased number of these “good news” outcomes from future graduates.

We affirm the Assessment as presented and trust that their recommendations will be considered by administration and cabinet.

REVIEW RECEIVED AND ACCEPTED BY THE SENATE, NOVEMBER 1, 2023.