

ACADEMIC COUNCIL REPORT

ACTION REQUESTED:

Recommendation
Decision
Discussion/Direction
Information

DATE: 22 June 2021

FROM: Undergraduate Studies Committee

SUBJECT: Program Review Final Assessment Report – Bachelor of Science in Forensic Science

COMMITTEE MANDATE:

In accordance with Article 10 of the Ontario Tech University Institutional Quality Assurance Process (IQAP) Cyclical Program Review (CPR) Procedures, the appropriate standing committee of Academic Council (USC or GSC) is responsible for examining the outcomes of the review and approving the Final Assessment Report (FAR). This report will be presented to Academic Council for information and subsequently posted to the Ontario Tech corporate website.

Additionally, in accordance with Article 6 of the IQAP Curriculum Change Procedures, editorial revisions to Program Learning Outcomes are considered Minor Program Adjustments and are sent to the standing committee for approval. Minor Program Adjustments are presented to Academic Council for information.

BACKGROUND/CONTEXT & RATIONALE:

In academic years 2017-2019 a program review was scheduled for Bachelor of Science in Forensic Science. The site visit was conducted in November-December 2020. At the completion of a CPR the self-study brief, reviewers' report(s), Dean's and IAT's response, and the Academic Resource Committee's (ARC) summary report are presented to the appropriate standing committee of Academic Council (USC or GSC).

The standing committee will examine the outcomes of the review and approve a Final Assessment Report (FAR) that synthesizes the reports and recommendations resulting from the review, identifies the strengths of the program as well as the opportunities for program improvement and enhancement, and outlines the agreed-upon implementation plans for this improvement.

Additionally, during a CPR the Program Learning Outcomes (PLOs) are reviewed and revised. If these revisions are deemed editorial in nature, they are included with the FAR for approval by the standing committee, in accordance with the procedure for Minor Program Adjustments.

A report from the program outlining the progress that has been made in implementing the recommendations will be put forward in eighteen months' time. The report is sent to ARC for review. If outstanding items remain from the implementation plan at the time of the eighteen-month report, ARC will review these outstanding items with the Dean. The Committee may recommend further monitoring of these items on a case-by-case basis.

RESOURCES REQUIRED:

The Faculty's plans to address any resource needs are outlined in the action plan. Information and support will be required from various areas of the University in order to implement the plan.

COMPLIANCE WITH POLICY/LEGISLATION:

The Ontario Universities Council on Quality Assurance (Quality Council), established by the Council of Ontario Universities in July 2010, is responsible for oversight of the Quality Assurance Framework processes for Ontario Universities. The Council operates at arm's length from both Ontario's publicly assisted universities and Ontario's government. Under the Quality Assurance Framework, academic programs must undergo a cyclical review at least every eight years following their implementation. The purpose of the cyclical program review is to critically examine the components of a program with the assistance of outside reviewers with the goal of continuous improvement. A program review's purpose is not solely to demonstrate the positive aspects of the program, but also to outline opportunities that will lead to improvements for the future.

NEXT STEPS:

- Following presentation to Academic Council and the Board of Governors for information, the FAR will be sent to the Quality Council as required under the Quality Assurance Framework. A summary report will then be posted on the Ontario Tech corporate website.

SUPPORTING REFERENCE MATERIALS:

- [Final Assessment Report](#)
- [PLO Enhancement and UDLE Mapping](#)
- [Academic Resource Committee \(ARC\) Summary Report](#)



FINAL ASSESSMENT REPORT
Executive Summary
March 2021
Bachelor of Science, Forensic Science
Program Review
Dean: Dr. Greg Crawford

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

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

On the completion of the program review, the self-study brief together with the reviewers' report and the assessment team's response are reviewed by the Resource committee, the appropriate standing committee of Academic Council (USC/GSC), and are subsequently reported to Academic Council, the Board of Governors and the Quality Council.

In academic years 2017-2019 a program review was scheduled for Bachelor of Science in Forensic Science.

This is the second program review for this program and the internal assessment team is to be commended for undertaking this assignment in addition to an already challenging workload and within a very tight timeline. The following pages provide a summary of the outcomes and action plans resulting from the review, identifying the strengths of the program as well as the opportunities for program improvement and enhancement. A report from the program outlining the progress that has been made in implementing the recommendations will also be put forward in eighteen months' time.

External Reviewers: Dr. Gail Anderson, Simon Fraser University & Dr. James Watterson, Laurentian University

Site Visit: November 30th to December 3rd, 2020

Program Overview

The BSc (Hons) in Forensic Science program at Ontario Tech is distinguished by a strong scientific foundation in biology and chemistry, with allied courses related to forensic aspects of identification, toxicology, physics, and law. Undergraduates of the Forensic Science program graduate with a Bachelor of Science (Hons) in Forensic Science. Currently students choose a specialization in Biology, Chemistry, or Physics.

These specializations allow students to further focus their studies in a subject of their choosing, as well as permitted the Forensic Science program to develop and introduce additional advanced level courses. In order to maintain a strong focus on natural sciences, the program maps differ very little between specializations, except for specialization-related courses beginning in 3rd year.

Through a careful selection of elective courses during their program, some students may choose to complete a subject Minor. Common minors obtained by Forensic Science students include biology, chemistry, and psychology (students cannot complete a minor in their major subject). Specialization and minor listings appear on the academic transcript, but does not appear on the degree parchment.

This program has been FEPAC (Forensic Science Education Programs Accreditation Commission) accredited since 2015 and was recently renewed for another five years in Winter 2019.

Significant Strengths of the Program

- There are good collaborations and synergy with industry and government.
- The program emphasizes critical thinking, social engagement and integrates experiences both in and outside the classroom.
- Student satisfaction with the program is evident.
- State of the art lab equipment and software.
- Well-planned coursework, that is designed to be responsive to the evolving workplace.
- Faculty with strong backgrounds in academic and practical aspects of forensic science
- FEPAC accreditation.

Opportunities for Program Improvement and Enhancement

- The development of a taphonomic research facility, to enhance the program's research capabilities and student experience (both graduate and undergraduate)
- The Forensic Science program may see retirements in the near future, and planning should begin now for potential replacements.

- The implementation of program map changes, including a reassessment of the chemistry course requirements, a new Forensic Foundations course and a new Legal Studies minor.

The External Review

The site visit took place on November 30th to December 3rd, 2020. Drs. Anderson and Watterson met with members of the Faculty as well as key stakeholders at the University, including Dr. Lori Livingston-Provost, Dr. Greg Crawford- Dean of the Faculty of Science, Cecilia Hageman- Undergraduate Program Director, and members of the internal assessment team and a number of faculty, staff, and students.

The Faculty was grateful for the thoughtful and thorough review provided. The external reviewers recognized the high quality of the faculty, the rigorousness of the program, and the innovation in the content and delivery of the programs.

The reviewers identified three recommendations, some of which have multiple components. The Faculty values the recommendations and have been very thoughtful in their responses.

Summary of Reviewer Recommendations and Faculty Responses

Recommendation 1

That a second technician is hired with a focus in chemistry to allow the instruments and laboratory to be utilized to its full potential.

IAT's Response to recommendation 1

The Forensic Science Program (FSP) faculty agree with the recommendations regarding hiring. In particular:

- We agree fully with the basis for the recommendation of hiring a chemistry technician to support and improve the program.
 - We anticipate that the issue of technician office space and the specific recommendation of proximity of office to lab will be part of the overall discussion regarding the upcoming UA building office assignment changes. We also note that construction is expected to start in February 2021 to renovating UB4079 to a shared office space for the program technician(s).
- The reviewers noted the related issues of the limited number of TTT faculty (leading to a dearth of student research experiences) and the boding necessity to replace a TF faculty member nearing retirement.
 - These hiring issues must also be considered with reference to FEPAC accreditation standards that require FSP faculty members to include those with forensic (such as casework) experience.
 - The TF faculty member nearing retirement has not yet decided on a definitive retirement date, but this date is likely to occur within the next two to three years.

- **We recommend developing and implementing an *ad hoc* strategic hiring plan to cover the next few years of the FS Program that could include:**
 - dedicated time for the TF faculty member to develop and implement an exit strategy to include, for example,
 - an on-line population genetics course
 - an on-line, or partially on-line law course, with a search for an adjunct/sessional from the legal community
 - a major program change to implement a “legal studies minor” program (see Recommendation #2)
 - A sessional faculty member is also close to retirement, but has not indicated a retirement date. The *ad hoc* strategic hiring plan should also include a search for an adjunct/sessional from the police (ident. unit) community.

Dean’s response:

This recommendation from the external reviewer comprises two separate components: I feel these are best addressed separately.

(1) I fully support the development of a plan for an expected retirement. It seems highly unlikely that an additional faculty member will be added to the ranks in the next few years. Whether or not a case can be made to replace the current TF with a TTT will depend on a number of factors, but I envision these discussions would naturally be a part of the planning process. As the faculty note, a key factor for maintaining accreditation is the caseload that faculty in the program need to maintain.

(2) Regarding the hiring of an additional technician with a specialization in chemistry, the value the reviewers focus on is that the instruments (particularly the chemistry-related instruments) and laboratory. The IAT’s response, above, echoes these values. I note that, over the past several years, I was able to provide additional part-time temporary technician support for a number of years. However, due to recent budget challenges, we lost that position.

New, full-time technician positions may be hard to come by for the next few years. In the short term, we will likely need to prioritize resource allocation/re-allocation, focusing first on the crucial needs to run programs. This may include some assessment across different Science programs, to understand where pressure points and flexibility may exist. While I certainly understand the challenges in training and keeping part-time staff, and will certainly factor into budget planning over the next few years the potential of an additional Forensic Science technician, I do not honestly expect an additional full-time tech hire in the near future. My Associate Deans and I will work with the Forensic Science faculty to identify and prioritize the supports for program labs, and then determine how best to build/rebuild capacity.

Recommendation 2

That some changes occur to the present curriculum including the introduction of a new Forensic Foundations course at the lower level; that the number of chemistry courses required in the forensic science and biology concentrations be reduced to allow more electives; that a legal studies minor be considered and that the Directed Studies capstone course be rolled into the thesis capstone course, reducing the total number of capstone courses to be on offer.

IAT's Response to recommendation 2

The FSP faculty agree with the recommendations regarding program changes. In particular:

- The FSP is heavily weighted to the third and fourth year FSCI courses, and we do not have nearly enough interactions with the students in the first two, especially formative, years. The Forensic Foundations (FF) Course would not only (at least assist to) remedy this problem, but also allow us to introduce key concepts of QA, statistics geared to forensic issues (including some Bayesian approaches) and research methods, all at a more appropriate time within the program map.
 - The FF course could also include some fundamental law topics, unless the Legal Studies minor initiative is also implemented – therefore, planning around these two program improvements would need to occur in concert to develop a program map that works and that continues to pass FEPAC standards.
- We recommend that two faculty members (TBD) be tasked with studying the reviewers' recommendation to reduce chemistry courses in the biology and physics specialization program maps and to recommend options that would maintain program quality of all three specialization program maps (chemistry, biology and physics) as well as continue to pass FEPAC requirements.
- We note that the reviewers heard from students that they needed more time in the Crime Scene House to complete the assigned work – this suggestion should be considered in any overall program map changes. In addition, the reviewers noted that a model to incorporate program maps outside of the traditional four year frame should be considered.

Dean's Response

This recommendation regarding curriculum has multiple parts to it; much of the required work lies with the relevant faculty members.

I will note that, from my perspective, there is currently inherent teaching capacity among the current faculty for an additional course; I would support this (although we would also need to factor this additional teaching workload in, in terms of making a case for a TTT hire to replace a retiring TF).

Examination of the other proposed curricular changes seem reasonable to me; I also support the proposed review of the capstone experience.

Recommendation 3

That the development of a human taphonomic research facility be explored.

IAT's Response to recommendation 3

The FSP faculty agree with the recommendations regarding the development of a human taphonomic research facility, and the repurposing of a portable to allow wet-lab facilities at the Crime Scene House.

- Planning for the proposed taphonomic facility has already begun, especially in terms of collaborators and potential sites. The FSP faculty realize that there are issues over and above strictly budgetary ones that need to be considered, and are dedicated to working with the Ontario Tech University administration to see this program and university initiative to fruition.

Dean's Response

I continue to support and participate in the exploration of a potential taphonomic research facility, as do the Forensic Science faculty.

Plan of Action

The table below presents a timeline of the actions planned to address the recommendations from the external report.

Recommendation	Proposed Follow-Up	Responsibility for Leading Follow Up*	Timeline	Resources/Support Needed
Planning for a faculty retirement	Development of a plan	Dean/Associate Deans, Forensic Science faculty	January 2022	N/A
Additional technical support	Conduct a review of current technician workload (possibly across Faculty) [need to understand better how techs are spending time currently]	Dean/Associate Deans, Forensic Science faculty, possibly other Science lab coordinators and technicians	January 2022	N/A
	Identify and prioritize any changes of tech workload in program/Faculty	Dean/Associate Deans, lab coordinators and technicians as necessary	March 2022	N/A
	If additional resource requests are warranted, include in budget submission for 2023	Dean/Associate Dean, in consultation with appropriate lab coordinators	November 2022	N/A
Curricular changes	Develop and submit proposed curricular revisions (including	Forensic Science faculty, in consultation with Dean (where	December 2021	TBD

	potential new course proposal)	additional resources may be required)		
Exploration of the development of a taphonomic research facility	Continue to pursue partnerships and funding model	Forensic Science faculty, Dean	Ongoing (This is a complex project. While progress is being made, it is difficult to establish timelines for creating and developing opportunities for partnerships and resourcing at this point.)	Senior Leadership Team; external partners

*The Dean of the Faculty, in consultation with the Program Review Chair shall be responsible for monitoring the Implementation Plan. The details of progress made will be presented to the Academic Resource Committee, Academic Council and the Board of Governors and filed in the Office of the Provost and Vice-President (Academic).

Recommendations not Addressed

All recommendations have been addressed in the previous table.

Due Date for 18-Month Follow-up on Plan of Action: **September 2022**

Date of Next Cyclical Review: **2025-2027**



Cyclical Program Review: Summary of program learning outcome enhancements

[This form should be used in cases where program learning outcomes have been enhanced for an existing undergraduate or graduate program. These updated program learning outcomes should be the result of a program review and have been developed with guidance from CIQE. This form will be appended to the Final Assessment Report]

Faculty: Science	
Program: Forensic Science	
Review year: 2017-2019	
Undergraduate: <input checked="" type="checkbox"/>	Graduate: <input type="checkbox"/>

Original program learning outcome(s): (Provide all of the initial program learning outcomes)

- Apply an in-depth knowledge and critical understanding of chemistry, biology, physics, and mathematics to identify, evaluate, analyse and interpret information and hypotheses relevant to forensic science
- Utilise independent learning and analytical skills to solve problems specific to forensic science and broader issues outside the discipline
- Formulate and conduct research or equivalent advanced scholarship in forensic science or a related discipline
- Critically evaluate and describe the principles, concepts, theories and assumptions that form the foundation of forensic science
- Communicate accurately and effectively in written and oral form with members of academia, government and industry, as well as the general public on matters related to the legal applications of science
- Recognize the limitations of the current state of knowledge in forensic science and appreciate the need to adapt to new and emerging technologies in the field
- Pursue further scholarly pursuits, employment, and community involvement to advance the knowledge base in forensic science and contribute towards the economic and societal growth of the community
- Be an active member of multidisciplinary and multicultural teams and appreciate the importance of academic integrity, professional ethical conduct, and social responsibility

Total number of original outcomes: 8

Proposed enhanced learning outcomes: (Updated outcomes as a result of the program review learning outcome workshops)

- Apply an in-depth knowledge and critical understanding of the natural sciences to analyze forensic data and evidence.
- Demonstrate the skills necessary to collect, process, analyze, and interpret forensic evidence.
- Conduct research and advanced scholarship in forensic science or a related discipline.
- Critically evaluate the principles, concepts, theories, and limitations of forensic science.
- Effectively communicate forensic science findings and principles to professionals and the general public.
- Evaluate the role, and ethical duties of, the expert witness in the justice system.
- Apply knowledge of industry quality assurance standards to assess the reliability of forensic techniques and practices.
- Participate in scholarly pursuits and professional endeavors that contribute towards the growth of the community.
- Practice academic integrity, professional ethical conduct, and social responsibility to be an engaged member of the Forensic Science community.

Total number of enhanced outcomes: 9

Have the enhanced outcomes been mapped to the degree-level expectations (DLEs)?

Yes **No**

If no, this should be completed no later than:

Are you providing any additional supporting documents? **Yes** **No**

If yes, which (list all)?

UDLE map is available from CIQE upon request.

	Apply an in-depth knowledge and critical understanding of the natural sciences to analyze forensic data and evidence.	Demonstrate the skills necessary to collect, process, analyze, and interpret forensic evidence.	Conduct research and advanced scholarship in forensic science or a related discipline.
Depth and Breadth of Knowledge	X		X
Knowledge of methodologies- An understanding of methods of enquiry or creative activity, or both, in their primary area of study that enables the student to:	X	X	X
Application of Knowledge-The ability to review, present and critically evaluate qualitative and quantitative information to:	X	X	X
Communication Skills		X	X
Awareness of limits of knowledge			
Autonomy and professional capacity- Qualities and transferable skills necessary for further study, employment, community involvement and other activities requiring:			X

Critically evaluate the principles, concepts, theories, and limitations of forensic science.	Effectively communicate forensic science findings and principles to professionals and the general public.	Evaluate the role, and ethical duties of, the expert witness in the justice system.	Apply knowledge of industry quality assurance standards to assess the reliability of forensic techniques and practices.	Participate in scholarly pursuits and professional endeavors that contribute towards the growth of the community.	Practice academic integrity, professional ethical conduct, and social responsibility to be an engaged member of the Forensic Science community.
X	X			X	
			X	X	
X	X	X	X	X	
X	X			X	X
X	X	X	X		X
		X		X	X