

Project P1912  
Final Report  
Engineering Technology to Engineering  
Pathway Development

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# 1 INTRODUCTION

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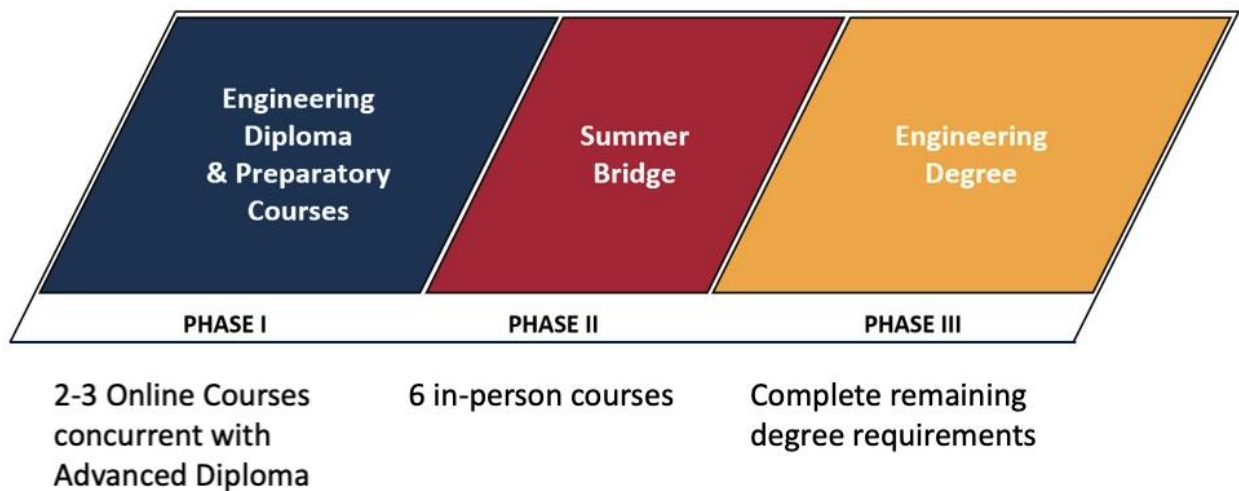
This document serves as the Final Report of the ONCAT project P1912. The development of this engineering transfer pathway continues as part of ONCAT project P2220. Since development is continuing and details are subject to change, this document shows a snapshot in time of the pathway development.

## 2 PATHWAY OVERVIEW

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The Engineering Technology to Engineering Pathway is a Queen's-led project supported by the Ontario Council on Articulation and Transfer (ONCAT). The objective of the project is to create an Ontario-wide network of transfer opportunities between Engineering Technology and Accredited Engineering programs. This will allow a student holding an Ontario Advanced Diploma in Engineering Technology from a participating college program to transfer cleanly into a participating Ontario Engineering Degree Program. Over time, the pathway will be scaled to include other sending and receiving institutions, so design decisions are made to accommodate this.

This transfer pathway must address the challenge of providing additional prerequisite university courses in a timely manner while maintaining a manageable college workload and ensuring that program accreditation requirements are met. Given these factors, a one-term Summer Bridge was not feasible which led to the development of a three-phase transfer pathway model:



The two or three transfer Preparatory Courses are asynchronous courses completed online while students complete the final year of their advanced diploma program. Performance in these courses is used as part of a conditional admission offer. They represent an opportunity for students to experience the rigour and workload expected in an engineering program without having to commit an entire semester of tuition or move cities.

The Summer Bridge consists of 6 courses taken in-person at Queen's. These custom courses were developed to address the specific course content gaps between the engineering technology and accredited engineering programs. Generally, five courses are common to all engineering disciplines, and one is specific to the engineering discipline.

The students then enter the upper years of their accredited engineering program and complete the remaining degree requirements after their transfer credits and bridging courses are factored in.

## 2.1 PROPOSED PATHWAY ELIGIBILITY CRITERIA

Students could apply to their desired receiving institution and complete the bridging courses from Queen's on a Letter of Permission.

It is proposed that applicants be considered from Engineering Technology students who have completed a minimum of 3 semesters and who have a cumulative GPA of 70% or above.

Then, successful applicants will be given a conditional acceptance offer requiring:

- Minimum grade of 70% in their Preparatory Courses
- Successfully complete diploma with a minimum 70% cumulative GPA.

Cases should be reviewed if the acceptance offer conditions are not met.

Progression from the Summer Bridge to the fall semester should be governed by standard Faculty Policies and Regulations.

## 2.2 WORKLOAD

The Preparatory Courses will be taken online on top of the students' normal college workload in their final year. The market research (n= 1286) found that students with a high interest in obtaining a degree reporting they feel they could take on 1 (32% of respondents), 2 (42% of respondents), or 3 (18% of respondents) courses at the same time as they finished their diploma. Therefore, the workload of the Preparatory Courses is not likely a large dissuading factor.

The Summer Bridge contains approximately 24 credits. The first year of the Queen's Engineering program contains approximately 20-24 credits per semester. Therefore, the workload of the Summer Bridge is similar to that of a first-year semester.

## 2.3 ACCREDITATION

The Canadian Engineering Accreditation Board (CEAB) accredits engineering programs. Graduating from an accredited program fulfills the academic requirement for licensure as a Professional Engineering (P.Eng.). There are additional requirements for licensure, including work experience and an exam.

This transfer pathway is not a distinct engineering program. Instead, the pathway offers students an alternate method of completing the requirements of existing accredited engineering programs.

An important consideration for accreditation is that a certain number of course credits must be taught by a professor with a P.Eng. The pathway is being designed so that licensure status of college professors will not be "counted" toward this requirement – the requirement will be met through the courses

delivered as part of the bridge and by the receiving institution. This requirement will be verified on a student-by-student basis in case students deviate from the standard pathway.

Another important consideration for accreditation is the validation process for systematically granting transfer credits. The accredited program must verify and provide evidence that the academic level of the course for which transfer credit is granted (i.e., the advanced diploma course) is equal to or above the academic level of the course in the accredited program. This was verified through a rigorous and documented transfer credit review process done with the course instructor. In addition, the sending program will share their course outlines each year and confirm the course content has not changed substantially since it was approved as a transfer credit. In cases where a course has changed, the new course outline will be reviewed by the course professor who teaches the course at the accredited program.

### 3 QUEEN'S ENGINEERING BRIDGE PILOT

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Queen's University will pilot this transfer pathway by receiving students into the civil and mining engineering programs from 6 partner engineering technology programs. Applicants from non-partner programs will also be considered.

While there are a variety of college students with various academic backgrounds who could potentially transfer into an accredited engineering program, this transfer pathway is open to eligible students (or graduates) from 3-year engineering technology programs in Ontario, with a focus on partnering sending institutions. Students from these programs will be eligible to apply if they have a 70% Grade Point Average (GPA) or above. Graduates from any Ontario engineering technology program are eligible for the pathway pending a case-by-case review of their transcript and eligible transfer credits. Students from institutions that do not meet these requirements or who are otherwise not eligible may still apply for entry into Queen's Engineering's common first year using existing transfer application mechanisms.

For the pilot program, the first cohort of students will apply for admission to Queen's in Summer 2023, complete Preparatory Courses concurrent with the final year of their advanced diploma during the 2023 - 2024 academic year, attend Queen's campus for the Summer Bridge in Summer 2024, and enter their selected discipline at Queen's in Fall 2024. Generally, students should apply for the same engineering discipline as their engineering technology diploma; however, students in mechanical or civil engineering technology programs could also apply for mining engineering due to the similarity in courses and interest from the Mining Department in attracting these students.

#### 3.1 EXAMPLE BRIDGING PATHWAY COURSES

The bridging courses, along with the transfer credits, would allow students to gain the key prerequisite credits in time to join the direct-entry cohort at approximately a third-year level in September. An example of the bridging courses for a typical civil engineering technology student bridging into the Queen's Engineering program are shown in Table 1.

Table 1: Example bridging courses for a civil engineering technology student transferring into the Queen’s civil engineering program.

PHASE	Course
<b>1: Preparatory Courses</b> Concurrent with diploma	Introduction to Linear Algebra (first-year)
	Physics 1 – Mechanics (first-year)
<b>2: Summer Bridge</b> In-person	Introductory Chemistry (first-year)
	Engineering Design and Practice (first- and second-year)
	Introduction to Computer Programming (first-year)
	Calculus II (first-year)
	Statistics and Differential Equations (second-year)
	Solid Mechanics II (second-year)
<b>3: Degree Completion</b> In-person	Students would take primarily third year courses, while backfilling any remaining first- or second-year courses as required – with space available due to upper-year transfer credits.

## 4 CONCLUSION

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This initiative proposes a common engineering transfer pathway to simplify the transfer process for students and institutions. The transfer process is simplified for engineering technology students by pre-determining the transfer credits, offering administrative and academic support throughout the transfer process, and providing a clear and welcoming transfer process. The pathway also has a manageable workload and results in few courses needing to be taken out of sequence.

From an institutional standpoint, this pathway should reduce the cost and complexity of accepting bridging students because the bridging courses that are already developed and being run by Queen’s can be leveraged. This will also standardize much of the administrative workload since the transfer credits will be predetermined and there are standard processes in place for admission and accreditation. It greatly improves the existing college-to-university engineering transfer landscape by providing a welcoming, supported, and clearly defined transfer pathway between multiple institutions.