



**Pathways from Sault College Diploma Programs in Natural  
Environment and Outdoor Studies to a Bachelor of Science at  
Algoma University**

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## Executive Summary

This project brought together university and college staff and faculty to complete specially-designed degree-completion curriculum in the fields of environmental science and natural environment and outdoor studies. The project resulted in the development of five pathways from the following Sault College diploma programs into a Bachelor of Science (Environmental Science) at Algoma University:

- i. Natural Environment Technician – Conservation and Management Diploma (CO-OP)
- ii. Natural Environment Technologist – Conservation and Management Diploma (CO-OP)
- iii. Forest Conservation Technician Diploma (CO-OP)
- iv. Fish & Wildlife Conservation Technician Diploma (CO-OP)
- v. Adventure Recreation and Parks Technician Diploma (CO-OP)

This project strategically linked university and college curriculum to facilitate the blending of theoretical knowledge with practical skill development in high-demand fields. The resultant pathways build on the strengths of Algoma University and Sault College by leveraging faculty expertise and community resources. Graduates will be well-positioned to move into the labour market in the Algoma region or elsewhere with a strong grounding in the key concepts and theories in the environmental sciences coupled with practical field skills and techniques.

## Introduction

The purpose of this collaborative project between Algoma University and Sault College was to complete specially designed degree-completion curriculum that built on the unique needs of the region and the strong regional-economic partnership between the two institutions. This project focused on the development of diploma-to-degree transfer arrangements from Sault College diploma programs in the School of Natural Environment and Outdoor Studies (NEOS) to a Bachelor of Science (Honours) in Environmental Science. Given the wealth of natural resources and systems in Sault Ste. Marie and the surrounding area, a collaboration between Algoma University and Sault College that leveraged faculty expertise and community resources in the fields of natural environment and outdoor studies and environmental science was a natural choice. The objective was to build pathways that would be replicable in the future with other institutions yet would also reflect the unique strengths of the two partners and the Algoma region.

Each year, Sault College prepares for enrolment of approximately 100 students amongst its natural environment diploma programs. Likewise, the Bachelor of Science (Honours) in Biology at Algoma University has seen 128% growth in enrolled majors since 2008. The Bachelor of Science (Honours) in Environmental Science is a new program offering at Algoma University that is about to be submitted for Ministerial consent through the review process of the Postsecondary Education Quality Assessment Board (PEQAB). It is expected the new environmental science program will be a popular offering, and will see steady growth following its approval.

The fields of natural and applied science have seen job gains in recent years. Consultations with local employers suggest an appropriate mix of theoretical and hands-on field experience is much needed in the local market. This project aimed to build pathways that would be highly

desirable to students and would provide the employer-desired blend of theoretical and applied education.

## Pathway Development

### Project Timelines

The following table outlines the key activities and timelines that were associated with the project, and the expected implementation schedule for future activities.

<b>Phase One: Pathway Development</b>	
<b>Activity</b>	<b>Completion Date</b>
Meeting of Algoma University and Sault College leadership team	May 31, 2014
Preliminary research on comparable pathways	May 31, 2014
Project Team meeting – curriculum analysis and review of potential models for collaboration	June 30, 2014
Detailed curriculum analysis complete	July 31, 2014
Preparation of first draft of pathway	July 31, 2014
Selection of gap analysis consultant	July 31, 2014
Facilitated gap analysis session	August 31, 2014
Second draft of pathway and bridge complete	September 30, 2014
Bachelor of Science (Environmental Science) program approved by Algoma University Senate	October 3, 2014
Consultation on bridging mathematics requirement and potential on-line component	October 31, 2014
Final review of pathway and bridge curriculum by Project Team	October 31, 2014
Submission of proposal for on-line mathematics bridge courses submitted to the Shared Online Course Fund	November 14, 2014
Pathway agreements approved by Science Division at Algoma University	December 31, 2014
Bachelor of Science (Environmental Science) program proposal, including degree completion curriculum, submitted to Minister of Training, Colleges and Universities	April 30, 2015
Partnered event for faculty and students of Algoma University and Sault College	October 31, 2015*
<b>Phase Two: Implementation*</b>	
Ministerial consent for Bachelor of Science (Environmental Science) received	April 30, 2016*
Final approval of pathways by the Algoma University Senate	May 31, 2016*
Communication on pathways to prospective students	June 30, 2016*
First intake of student into degree completion pathway	September 1, 2016*

*\*implementation dates are tentative and are influenced by the requirement for Algoma University to seek Ministerial consent for new programs through the review process of the Postsecondary Education Quality Assessment Board (PEQAB). Timelines associated with the review process are approximate and outside of the control of the institution and the Project Team.*

## Pathway Development Process

This project used a systematic process to facilitate pathway development. The Project Team included subject matter experts from the university and the college, as well as staff and administration for guidance and support.

The project began with the subject matter experts of Algoma University and Sault College sharing information on the diploma and degree programs. This project involved constructing pathways into a degree program that has not yet received Ministerial consent. In this context, Algoma University faculty shared details on the program development process, program curriculum, and feedback from the advisory committee on the incorporation of experiential learning into the Bachelor of Science (Honours) in Environmental Science. The Sault College diploma programs are well-established. Sault College faculty shared details on course curriculum, student demographics, and graduate outcomes for all diploma programs in the School of Natural Environment and Outdoor Studies (NEOS). While the funding was originally received to develop pathways from three NEOS diploma programs, these preliminary conversations identified five diploma programs with high affinity to the proposed Bachelor of Science (Honours) in Environmental Science.

The five diploma programs identified were as follows:

- i. Natural Environment Technician – Conservation and Management Diploma (CO-OP)
- ii. Natural Environment Technologist – Conservation and Management Diploma (CO-OP)
- iii. Forest Conservation Technician Diploma (CO-OP)
- iv. Fish & Wildlife Conservation Technician Diploma (CO-OP)
- v. Adventure Recreation and Parks Technician Diploma (CO-OP)

The Project Team completed a preliminary review of the detailed course outlines for core courses in each of the five NEOS diploma programs and the Bachelor of Science (B.Sc.) degree program. This preliminary analysis resulted in a unique approach to developing pathways into the B.Sc. degree program. Transfer pathways typically follow a bottom to top approach where students earn transfer credit in the first or second year of the degree program and then 'ladder-in' to program curriculum at either the second or third year. The preliminary curriculum analysis demonstrated the diploma graduates of NEOS programs are highly skilled in specific practical knowledge and skills that are developed in years two, three, and four of the B.Sc. degree program. However, portions of the breadth of first-year introductory science content (mathematics, chemistry, biology) were not covered in sufficient depth in the diploma curriculum. It became clear that a hybrid approach to pathway development was needed where students would be required to complete most of the compulsory year one curriculum in the B.Sc. program and would then receive credit for particular courses and course groupings in each of years two to four. In order to do the preliminary analysis, courses in the diploma programs were grouped together. A first draft of each of the five pathways was created where groups of courses 'as a package' were considered to have met the learning outcomes of various courses in the B.Sc. degree program.

Following the preliminary curriculum analysis, the Project Team engaged a consultant to facilitate a gap analysis process that would further refine the pathways. The Team selected a consultant with extensive experience building college-to-university pathways and new degree programs using an outcomes-based approach. The Project Team participated in a half-day session which included an introduction to gap analysis based on learning outcomes and a collaborative exercise where diploma program outcomes were compared to degree program

outcomes and the University Undergraduate Degree Level Expectations (UUDLEs). The primary outcome of the gap analysis exercise included the identification of a need for a bridge in mathematics for diploma graduates who have not completed MHF4U (Advanced Functions) or the equivalent in secondary school. The College Outreach and Support Office in the Office of the Registrar at Algoma University played a key role in taking the findings of the gap analysis and preparing and refining drafts of the pathways. The process also resulted in the identification of innovative ways for the institutions to collaborate outside of the curriculum including faculty from each institution visiting the other as guest speakers, joint field camp activities, student presentations between institutions, and social events around shared interests (i.e. outdoor club, biology club).

Final revisions to the pathway curriculum were completed over the Fall term in 2014. A joint meeting was held to further explore the mathematics bridge. The Project Team created two pathways for each NEOS diploma programs – one that included a mathematics bridge for students who have not completed MHF4U or the equivalent, and one for students who have the requisite background in mathematics to enter the pathway directly. As outlined in the project plan, at this point there was consideration for the incorporation of an on-line component.

A collaborative proposal was developed and submitted to the Shared Online Course Fund for on-line versions of MATH 1911 (Precalculus) and MATH 1912 (Elementary Calculus). These Algoma University courses together constitute the equivalent of the mathematics admission requirements for students to the B.Sc. program. The proposed online versions of the courses were aimed at college transfer students who require a 'bridge' in mathematical preparedness prior to entering a university program. The proposed new online courses would include the same curriculum as the courses currently cover in class, yet would be co-developed with Sault College to ensure the course design and delivery facilitates a seamless transition for college transfer students who wish to pursue a university degree where Mathematics is a prerequisite for entry. The objective is that the course would be taken in the final year of college for students interested in a seamless transition to university programs requiring mathematical preparedness. The Project Team is still awaiting a final decision from the Ministry of Training, Colleges and Universities on the funding. Alternatives for students to meet the mathematics requirements were also explored by the Project Team.

The final degree completion curriculum was incorporated into the proposal for Ministerial consent for Algoma University's Bachelor of Science (Honours) in Environmental Science. The application is undergoing final revisions and is expected to be submitted to the Minister of Training, Colleges and Universities by the end of April 2015. The Science Division at Algoma University has approved each of the five pathways for inclusion in the proposal. Once the B.Sc. program receives Ministerial consent, the developed pathways can proceed through the Algoma University Senate for approval and the pathways can be communicated to prospective students and posted to the OnTransfer database.

Overall, the process resulted in a framework that is highly replicable for other diploma-to-degree pathways in the sciences. This project built on a strong institutional partnership based on common regional-economic objectives. Once implemented, the pathway will facilitate seamless transfer for students that is grounded in a shared commitment to post-secondary education in the natural sciences in the Algoma region.

## Project Outcomes

The project resulted in the following outcomes:

- Diploma-to-degree pathways for graduates of the five Sault College diploma programs listed below into the proposed Bachelor of Science (Honours) in Environmental Science at Algoma University
  - Natural Environment Technician – Conservation and Management Diploma (CO-OP)
  - Natural Environment Technologist – Conservation and Management Diploma (CO-OP)
  - Forest Conservation Technician Diploma (CO-OP)
  - Fish & Wildlife Conservation Technician Diploma (CO-OP)
  - Adventure Recreation and Parks Technician Diploma (CO-OP)
- Completion of a detailed curriculum and gap analysis for each of the five pathways
- Development of a mathematics bridge for students who have not completed MHF4U or the equivalent
- Submission of a funding proposal to the Shared Online Course Fund for the development of collaborative on-line versions of courses that would serve as a mathematics bridge and could be taken in a student's final year of study at Sault College
- Completion of the diploma-to-degree and gap analysis sections of the application for Ministerial consent for a Bachelor of Science (Honours) in Environmental Science
- Identification of areas for collaboration between Algoma University and Sault College outside of the academic curriculum