

PROGRAM INFORMATION

Academic Year	2024 - 2025
Credential	Ontario College Diploma
Program	Delivery: Full - Time
Duration	2 Years
Length	4 or 6 Semesters

Program Codes

T089 – 6 Semesters Compressed with Co-op
[View Flow Chart of Courses by Semester for T089](#)

T090 – 4 Semesters Uncompressed (No Co-op)
[View Flow Chart of Courses by Semester for T090](#)

DESCRIPTION

Clean water – for people and the planet.

Graduate with powerful skills and up to a year of paid co-op experience* thanks to Northern's Environmental Technician – Water and Wastewater Systems Operations diploma. Combining on-site and distance learning – and offered in both standard and co-op delivery – you'll gain the specialized training you need to master every step of the treatment process. You'll understand the design and operation of complex treatment facilities.

You'll learn the role that chemicals and microorganisms play in the process. And you'll master the lab techniques and safety protocols required to make a real difference for the environment and in our everyday lives. Along the way, you'll also improve your problem-solving skills, gain a solid foundation in chemistry and physics, and earn the confidence you'll need as a licensed hands-on operator.

This program provides the specialized training required to become a licensed drinking water and/or wastewater systems operator under Ontario's rigorous standards. You'll train for interesting, good-paying, stable work opportunities that are making a real difference in our environment. This is the fastest path to Ontario licensing qualifications.

It's a trades-focused, hands-on operator's line of work – where operations and practical environmental stewardship meet. Students have a choice of studying under the original compressed co-op delivery program or an uncompressed, non-co-op delivery. Both options include a blended program combining on-site and distance learning. Co-op education provides an opportunity to earn while you learn.

DELIVERY OPTIONS

Compressed with Co-op (T089)

Co-operative education is a structured method of combining classroom-based education with an academic credit for practical work experience. Our original program co-op delivery option provides students with the fastest path to becoming fully licensed operators in Ontario. Students follow a continuous 6-semester cycle of academic and placement semesters, taking 2 years of continuous study or placements until graduation.

This compressed (4 academic semesters into 3) delivery prepares students with a strong combination of theory and the opportunity to obtain up to one year of paid co-op practical systems operator experience. Because it is a compressed delivery, the academic semesters have up to 27-28 hours classes/ week.

Northern College will make every effort to assist students in finding co-op employment but cannot guarantee co-op employment. Students are encouraged to speak with local employers in water and/or wastewater treatment plants about co-op placements prior to starting the program.

Students write the Ontario Operator-In-Training (OIT, a kind of “learner permit”) examination and the Drinking Water Operators Entry-Level Course exam, and through three 4-month-long co-op placement semesters have the opportunity to obtain the year of work experience required to take their full industry certification exams and enter the industry as fully licensed Class I operators.

This program is now recognized by OACETT as meeting the requirements for the Certified Technician designation for graduates. This provides a path to earning the C.Tech. credential but please note the program is not nationally accredited by Technology Accreditation Canada (TAC) so some additional steps are required.

Please contact us for further clarification.

Uncompressed No Co-Op (T090)

This delivery option paces the 1170 hours of courses more evenly across 4 regular fall and winter academic semesters. It is a recommended path for International students for greater certainty of obtaining a minimum 2-year post-graduate work visa permit after graduation, or for students that prefer a workload with lighter weekly hours of study. Students may be able to find industry-related work in the summers but still will require acceptable proof of Ontario Grade 12 equivalency as a prerequisite to writing their Operator in Training (OIT) exam.

An OIT certificate is needed to work in Ontario municipal plants. This program delivery option provides the same 1170 hours of course instruction as the compressed 3 academic semester co-op program. However, the weekly hours of instruction are lighter given the courses are spread over 4 instead of 3 academic semesters.

CAREER OPPORTUNITIES

Graduates may find employment in municipal water and waste water facilities, environmental departments in mines and other industries, solid waste management facilities, and in government.

- Environmental technician
- Employed by municipal governments and industrial facilities, consulting engineering and construction companies, public works, transportation and other government agencies in a variety of industries.

VOCATIONAL LEARNING OUTCOMES

1. Collect representative environmental samples and perform routine tests, using current and relevant tools.
2. Use scientific concepts and models when contributing to the prevention, control and elimination of environmental hazards and remediation of contaminated sites.
3. Assist with analysis of water/soil/air samples and with the resolution of environmental problems through the application of scientific and engineering principles.
4. Follow standards procedures for conducting environmental sampling projects including the use of appropriate equipment and materials.
5. Promote and maintain sustainable practices by applying the elements of ecosystem-based management.
6. Carry out work responsibilities adhering to standards of professional conduct and principles of professional ethics.
7. Complete assigned tasks in adherence to occupational health and safety standards and applicable legislative requirements.
8. Follow established protocols in support of environmental management systems.
9. Provide ongoing support for project management.
10. Communicate technical information accurately and effectively in oral, written, visual and electronic forms.
11. Develop and present strategies for ongoing personal and professional development to enhance performance as an environmental technician.

PROGRAM COURSES

The following reflects the planned course sequence for full-time offerings of the program. Programs at Northern College are delivered using a variety of instruction modes. Courses may be offered in the classroom or lab, entirely online, or in a hybrid mode which combines classroom sessions with virtual learning activities.

Semester 1 - T090	Hours
CM1323 Professional Communications	42
EV1013 Chemistry and Physics	42
EV1053 Basic Math for Systems Operators	42
IN1093 Computer Applications for Business & Technology	42
WM1004 Water Monitoring and Sampling	56
WM2023 Intro to Wastewater Collections and Treatment	42
Semester 2 - T090	
BU1103 Introduction to Human Resources	42
CM2303 Communications for the Workplace	42
EV2004 Plant Operations II	28
EV4013 Pumps and Motors	42
EV4016 Instrumentation and Process Control	84
EV4023 Statistics for Operations Process Control	42
EV4032 Chlorine Maintenance	28
GN2013 Co-op Study	30
WM4002 Waste Characteristics	28
Semester 3 - T090	
General Education Elective	42
General Education Elective	42
EV2013 Soil and Air Monitoring & Sampling	28
GN1033 Health and Safety	42
GN1443 Indigenous Culture and Awareness	42
IN4163 Introduction to GIS	42
Semester 4 - T090	
EV1000 Drinking Water Operations – Self Study	40
EV1033 Millwright and Water Treatment Plant 1	42
EV2053 Problem Solving in Water and Wastewater Treatment	42
EV3005 Certification Exams Preparation	70
EV4022 Laboratory Procedures	28
WM2011 Wastewater Digester Operation and Nutrient Removal	14
WM3003 Hydrogeology	28
WM4022 Environmental Regulations and Legislation	28

Semester 1 - T089	Hours
CM1323 Professional Communications	42
EV1013 Chemistry and Physics	42
EV1053 Basic Math for Systems Operators	42
EV2013 Soil and Air Monitoring & Sampling	28
GN1033 Health and Safety	42
IN1093 Computer Applications for Business & Technology	42
IN4163 Introduction to GIS	42
WM1004 Water Monitoring and Sampling	56
WM2023 Intro to Wastewater Collections and Treatment	42
Semester 2 - T089	
CM2303 Communications for the Workplace	42
EV1000 Drinking Water Operations – Self Study	40
EV2004 Plant Operations II	28
EV2053 Problem Solving in Water and Wastewater Treatment	42
EV3005 Certification Exams Preparation	70
EV4013 Pumps and Motors	42
EV4016 Instrumentation and Process Control	84
EV4032 Chlorine Maintenance	28
GN2013 Co-op Study	30
WM4002 Waste Characteristics	28
Semester 3 - T089	
Co-Op Work Term I	
Semester 4 - T089	
Co-op Work Term II	
Semester 5 - T089	
BU1103 Introduction to Human Resources	42
General Education Elective	42
General Education Elective	42
EV1033 Millwright and Water Treatment Plant 1	42
EV4022 Laboratory Procedures	28
EV4023 Statistics for Operations Process Control	42
GN1443 Indigenous Culture and Awareness	42
WM2011 Wastewater Digester Operation and Nutrient Removal	14
WM3003 Hydrogeology	28
WM4022 Environmental Regulations and Legislation	28
Semester 6 – T089	
Co-Op Work Term III	

PROGRAM PROGRESSION

The following reflects the planned progression for full-time offerings of the program.

Fall Intake

Sem 1: Fall 2024

Sem 2: Winter 2025

Winter Intake

Sem 1: Winter 2025

Sem 2: Summer 2025

WORK INTEGRATED LEARNING OPPORTUNITIES

Northern cannot guarantee co-op employment; students are encouraged to contact local waste and wastewater employers before starting the program.

ARTICULATION/TRANSFER AGREEMENTS

A number of articulation agreements have been negotiated with universities and other institutions across Canada, North America and internationally. These agreements are assessed, revised and updated on a regular basis. Please contact the program coordinator for specific details if you are interested in pursuing such an option. Additional information can be found at [Articulation Agreements](#).

ADDITIONAL INFORMATION

Class “G” Driver’s License

A valid Class “G” driver’s license is required by many co-op employers. Employment as a water or wastewater operator entails a physical component including some lifting.

Physical Requirements

Students who are concerned about their ability to meet the physical requirements of their intended career are strongly urged to discuss the matter with the College’s Admissions Office before registering in the program.

Equipment

Students need to purchase two pieces of equipment. These are a requirement for students when working in Ontario drinking water and wastewater plants:

1. A non-programmable scientific calculator – e.g. Texas Instruments TI30XA Scientific/Statistics (or equivalent). Preferred that students purchase this model for ease of instruction if you do not have one.

2. Steel toed work boots are a requirement in certain of our program labs – e.g. Pumps and Motors, Millwrighting, and when working with the water treatment plant.

For those students in the co-op version of the program, many employers provide work wear (pants, shirts, hard hats) to students free of charge while they are on co-op. However, steel toed work boots are not supplied. Therefore, the following is a suggested personal equipment list to prepare you for this program:

- Steel toed work boots (required)
- Work pants (optional)
- Work shirts – orange reflective type (optional)
- Safety goggles (optional)
- Hard hat (optional)
- Lab coat (optional)

PROGRAM SPECIFIC REQUIREMENTS

N/A

ADMISSION REQUIREMENTS

- Ontario Secondary School Diploma (OSSD)
- Grade 12 English (C, U)
- Grade 12 Math (C, U) (MCT4C preferred; MAP4C is accepted with a minimum GPA of 60%)
- Or equivalent

Academic prerequisites for this program may be obtained free of charge through [Academic Upgrading](#). Applicants who do not have a high school diploma or equivalent and will have reached the age of 19 years on or before the start of the program must undergo academic testing and may be required to complete [Prior Learning Assessment & Recognition \(PLAR\)](#) process to demonstrate equivalency of admission requirements prior to admission into a program. For more details, please contact the Admissions Office at 705-235-7222 or admissions@northern.on.ca.

The Ministry of the Environment requires all students to have their high school diploma or grade 12 equivalency in order to qualify to write the Operator in Training (OIT) examination. An OIT certificate is needed to work in any Ontario municipal water or waste-water plant.

Additional Requirements for International Students

In addition to the general admission requirements, international students must have proof of English Proficiency and meet the requirements below.

1. Proof of Senior High School Diploma/Certificate
2. English Proficiency (we will require one of the following):

- IELTS Academic (International English Language Testing System – minimum overall score of 6.0 must be achieved, with no individual band score under 5.5.
- TOEFL (Test of English as a Foreign Language) – Internet Based Test (iBT) overall minimum score of 79.
- PTE (Pearson Test of English) Academic 58+.

Plus Grade 12 (OSSD) equivalent Core Course with 50% in each equivalents for Mathematics (technical).

This is an Ontario college two-year diploma compressed into 3 academic semesters, and 3 co-op placement semesters. A non-co-op diploma is an option but with shorter program completion dates – but can affect immigration visa dates.

Based on International student feedback we are advising International students to choose our uncompressed 4 semester non-co-op program option since it gives greater certainty of being provided with a (minimum) 2 year post-graduate work permit on program completion. If your country of citizenship has English as its official language, we may accept alternate proof of English Proficiency. All educational documents must be submitted in English and will be dependent on the country of citizenship. For more information, please contact admissions@northern.on.ca.

Industry Regulations and Licensing

Operator-In-Training (OIT) Certificate

This is a “learner’s permit” earned via an exam taken during our program, that is required to work in municipal water or waste-water plants. The Ontario Ministry of Environment (MOE) oversees this process, and requires that students must pass an OIT written exam AND provide evidence of equivalent to Ontario Grade 12 education prior to working in these plants. (see further note, below)

Class 1 Operator Licensing

A Class 1 operator licence is the entry-level qualification needed to work as a full-time water and/or waste-water operator in Ontario. We provide students with the theoretical knowledge to write this exam that is set by the MOE’s Water and Wastewater Certification Office (OWWCO). Students must also first obtain a total of 12 months of industry-related work – via placements, summer jobs or after graduation — to be able to write this provincial licensing exam and become a fully Class I licensed operator.

Regulation – Equivalency to Ontario Grade 12

The MOE requires all students to have evidence acceptable to them of their educational equivalence to Ontario high school in order to qualify to write the OIT examination. We encourage International applicants who have a diploma or degree to have this documentation evaluated early in your application process by sending your documentation to the World Education Services (WES) assessment centre.

- **WES (World Education Services):** Students that wish to be able to work in municipal plants during their first summer in Canada are advised to proceed via WES (World Education Services) – **and to make this application prior to starting the program given the time required for documents to be processed in India as well as at WES.** This is the preferred route for students that want to work in municipal plants in their first summer, helping them progress more quickly towards the 12 months of related work experience required to write the MOE's Class I operator's exam.

OR

- **Completing the First Year of the Program at Northern:** After students successfully complete all their courses in the first two Academic semesters they will be able to receive a letter from Northern College stating that since they have passed their first year of college they have achieved the equivalence of Ontario Grade 12. With this and their OIT certificate, they will be able to look for work in municipal water or wastewater plants. This does not delay graduation from the program (possibly with a non-co-op diploma), but the timing results in students not being eligible to work in their first summer in an Ontario municipal water plant.

International students who don't have their WES-certified equivalency to Ontario Grade 12 prior to entering the program will not be able to work in Ontario municipal drinking water and wastewater plants in summer after program completion. Students can work in other jobs in Ontario summer after completion of program (and part-time during the academic semester — as per the student study visa rules). Students may find program-related work in non-municipal wastewater treatment plants (various industries, mines etc.) during summer after completion of program. Depending on the nature of this work, it may be able to count towards the year of workplace experience needed to write the Class 1 wastewater licensing exams.

GRADUATION REQUIREMENTS

- 23 Program Courses
- 2 Communications Courses
- 4 General Education Courses

GRADUATION ELIGIBILITY

To graduate from this program, a student must attain a minimum of 60% or a letter grade of CR (Credit) in each course in each semester unless otherwise stated on the course outline. Students should consult departmental policies and manuals for additional detail and exceptions.

GRADUATION WINDOW

Students unable to adhere to the program duration of two years (as stated above) may take a maximum of four years to complete their credential. After this time, students must be re-admitted into the program, and follow the curriculum in place at the time of re-admission.

CONTACT INFORMATION

For questions about being admitted into the program, please contact Northern College Admissions at admissions@northern.on.ca or by phone at 705-235-3211 ext. 7222. For questions about the content of the program, contact the Program Coordinator.

Kellie Broderick
Program Assistant, Environmental Technician Program
Tel: 705-672-3376 ext. 8854
Email: envtech@northern.on.ca

Richard Kallio
Program Coordinator, Environmental Technician Program
Tel: 705-567-9291 ext. 3705
Email: kallior@northern.on.ca

COURSE DESCRIPTIONS

Semester 1 & 2

CM1323 Professional Communications

In this course, students will learn essential skills for success in college and the workplace. This course focuses on developing and strengthening oral and written communication skills, and critical thinking ability. During this course, students will engage in a variety of forms of communication with a focus on upholding the principles of academic integrity. Students will develop the skills necessary to create discipline-specific documents, practice business etiquette and professionalism, and apply critical thinking strategies to practical scenarios. Upon successful completion of this course, students will be able to plan and draft concise, coherent and well-organized writing assignments that are tailored to specific audiences and purposes.

EV1013 Chemistry and Physics

This is a course in basic chemistry and physics for water and wastewater plant operations. Topics include chemical processes involved in water and wastewater treatment, the physics of water distribution systems and wastewater collection systems, and basic electricity.

EV1053 Basic Math for Systems Operators

Fundamental mathematical skills of an operator/technician, including basic arithmetic, the metric system, unit conversions, mensuration, and basic algebra.

EV2013 Soil and Air Monitoring & Sampling

Basic soil and air sampling, and analytical techniques for waste facility workers. Soil characteristics, soil classification, monitoring and sampling, the composition of our atmosphere, air pollution, and air quality monitoring and sampling.

GN1033 Health and Safety

This course introduces the student to health and safety in their home, in society and within an occupational setting. Students learn about the social and personal benefits of safe work practices and the methods to best prevent accidents or injuries. Students will review the role, right and responsibilities of an individual in today's health and safety conscious world. Students also learn how to read and interpret the Occupational Act and Regulations.

IN1093 Computer Applications for Business & Technology

In this course, students will gain practical experience with the essential features of Microsoft Office – MS Word, MS Excel, and MS PowerPoint to enhance their communication and analytical skills. Basic computer skills are required as prerequisite. Students will gain hands-on experience with file management, software settings, system security, Word Reports (APA Functions), tables, advanced presentation functions, summarizing and analyzing data in Excel through a series of learning activities, projects, and exercises that focus on real world examples. Students gain practical knowledge that can be applied directly to the workplace setting.

IN4163 Introduction to GIS

Introduction to GIS is an introduction to Geographic Information Systems. Geographic Information Systems involves the manipulation of databases to produce a variety of reports and/or maps.

WM1004 Water Monitoring and Sampling

Basic sampling, lab skills and analytical techniques for water and wastewater plant operators.

WM2023 Intro to Wastewater Collections and Treatment

Introduction to the design and operation of facilities for wastewater treatment and collection.

BU1103 Introduction to Human Resources

In this course, students will learn how proper recruitment/selection strategies, and training and development methods, maintain an organization's competitive advantage. The integral role of job design and analysis in affecting compensation management and performance appraisal decisions will be examined. Students will investigate a variety of employment and health and safety laws as they relate to managing a diverse workforce. In addition, the fundamental principles of the union-management framework will be explored.

CM2303 Communications for the Workplace

In this course, students will develop professional communication skills required for success in the workplace. Students will continue to develop and strengthen their oral and written communication skills and critical thinking abilities. During this course, students will use various modes of communication to complete assignments designed to meet program and professional expectations. Students will utilize a variety of technologies for the purpose of creating a professional presence in a digital environment. Students will develop the necessary skills to create polished workplace documents such as letters, resumes, cover letters and reports tailored to specific audiences. Students will learn to conduct themselves with professionalism in both workplace interviews and job searches. Upon successful completion of this course, students will be able to create clear, concise and coherent workplace and employment documents that are error-free and designed for specific audiences and purposes.

EV1000 Drinking Water Operations – Self Study

This 40 hours self study is preparation for the classroom component of the Ministry of the Environment and Climate Change's (MOECC) Entry Level Course for Drinking Water Operators, taught as part of EV3005 Certification Preparation.

EV1033 Millwright and Water Treatment Plant 1

This is a basic course in millwright's theory for operators of water and wastewater treatment plants. A millwright is a craftsman or tradesman who installs, dismantles, repairs, reassembles, and moves machinery in factories, power plants, and construction sites. The intention is not to provide a comprehensive view of the duties of a millwright, but rather to acquaint the student with the knowledge of a millwright's work that is most applicable to the maintenance of water and wastewater plant equipment. The course covers basic pumps, valves, motors and alignment, seals and bearings, bolts and fasteners, and concepts in plant safety with regards to cutting and welding, and basic material handling and rigging. The final module provides an opportunity to work with the college's pilot drinking water treatment plant, producing water, and students will learn to explain the major components, treatment process steps and common problems and solutions via a combination of theory and learning by doing.

EV2053 Problem Solving in Water and Wastewater Treatment

Applied mathematics for water and wastewater treatment operators.

EV3005 Certification Exams Preparation

Design and operation of water and wastewater treatment facilities in preparation for the Operator In Training (OIT) Examinations (40 hours), plus a 35 hour course in preparation for the Ministry of the Environment and Climate Change's (MOECC) Entry-Level Course for Drinking Water Operators exam, delivered in partnership with the MOECC and the Walkerton Clean Water Centre.

GN2013 Co-op Studies

This course is intended to raise the awareness of the importance of experiential learning through the co-operative education process. The student is encouraged to actively identify and discuss the merits of a three-way partnership between the college, the employer, and the student. Various skills are introduced to help the student prepare himself/herself using self-assessment, career planning, and job search tools.

EV4022 Laboratory Procedures

Plant operator's laboratory responsibilities including lab techniques, safety and hygiene, regulations, sampling, quality control, record keeping, and the interpretation of laboratory results.

WM2011 Wastewater Digestion and Nutrient Removal

This course focuses on two specific areas of wastewater treatment: Module 1 begins with an overview of wastewater processes, then concentrates on Biological Nutrient Removal (BNR). BNR is a process tackling the reduction of polluting chemical nutrients that are not eliminated via the normal activated sludge treatment process. Module 2 focuses on the operation of sludge digesters — a biological treatment step that reduces the sludge volumes and produces a sludge free of bacteria and pathogens — safe and dirt-like.

WM3003 Hydrogeology

This course introduces the student to the principles of hydrology and hydrogeology and how they relate to water, wastewater, and waste management. The course is introductory in nature and covers a broad range of topics. This course will enable the student to understand the terminology and basic concepts of hydrology, the hydrologic cycle and related geologic principles. Water quality and contamination, and principles of its measurement, site analysis, and clean-up will be studied. The successful student should be well prepared to participate in site investigations and well site planning by understanding the major variables and influencing factors on both surface and groundwater systems.

WM4022 Environmental Regulations and Legislation

This course offers an introduction to, and understanding of, several Acts and Regulations that Environmental Technicians and Water Treatment Technicians will encounter. Students will be introduced to these Acts and shown how to interpret them. They will additionally learn how to plan strategies for, comply with, report, and act on environmental incidents.

Semester 3 & 4 (Compressed Co-op Semester 5)

Co-Op Work Term (T089)

During the Summer / Fall semesters of the program, students will complete three co-op work placements totally 1170 hours.

Fall intake students will complete Work Term 1 and 2 after second semester of studies and Work Term 3 in the summer after the last semester. Winter intake students will complete Work Term 1 after the first semester of studies and Work Term 2 and 3 after the last semester of studies.

EN2010 Co-Op Work Term 1

EN4010 Co-Op Work Term 2

EN6010 Co-Op Work Term 3

[Flow Chart Compressed](#)

General Education Elective

General Education Courses are selected online each semester by the student from a list provided and exposes students to a related area of study outside of their immediate academic discipline. Certain programs have predetermined electives.

EV2004 Plant Operations II

Operation of water and wastewater treatment facilities preparing for successful completion of the Class I Operator Examination.

EV4013 Pumps and Motors

The use of pumps and motors in water and wastewater plants; their choice for a given application, installation, use and maintenance.

EV4016 Instrumentation and Process Control

An introduction to industry instrumentation; basic electricity and motor control relays, starters, switches, breakers, overloads, float controls, instrument recorders, process loops, and the fundamentals of PLCs. Process control including measurement and control systems, process parameters, safety, and the operation and maintenance of this equipment.

EV4023 Statistics for Operations Process Control

Directed lab exercises to reinforce theory concepts in EV4016 Instrumentation and Process Control.

EV4032 Chlorine Maintenance

The use of chlorine as a disinfectant including handling, operation of chlorinators, confined space rules and procedures, and SCBA.

WM4002 Waste Characteristics

The activated sludge treatment process in depth; types and roles of microorganisms in wastewater treatment.